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Aerospace Medicine and Biology
A Continuing Bibliography with Indexes

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AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

(Supplement 281)

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in January 1986 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*

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INTRODUCTION

This Supplement to *Aerospace Medicine and Biology* lists 153 reports, articles and other documents announced during January 1986 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)* The first issue of the bibliography was published in July 1964

In its subject coverage, *Aerospace Medicine and Biology* concentrates on the biological, physiological, psychological, and environmental effects to which man is subjected during and following simulated or actual flight in the Earth's atmosphere or in interplanetary space References describing similar effects of biological organisms of lower order are also included Such related topics as sanitary problems, pharmacology, toxicology, safety and survival, life support systems, exobiology, and personnel factors receive appropriate attention In general, emphasis is placed on applied research, but references to fundamental studies and theoretical principles related to experimental development also qualify for inclusion

Each entry in the bibliography consists of a bibliographic citation accompanied in most cases by an abstract The listing of the entries is arranged by *STAR* categories 51 through 55, the Life Sciences division The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR*, including the original accession numbers from the respective announcement journals The *IAA* items will precede the *STAR* items within each category

Seven indexes -- subject, personal author, corporate source, foreign technology, contract, report number, and accession number -- are included

An annual index will be prepared at the end of the calendar year covering all documents listed in the 1986 Supplements

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LIFE SCIENCES (GENERAL)

Includes genetics

A86-10101
CORRELATION BETWEEN PLASMA FIBRONECTIN LEVEL AND EXPERIMENTAL RATE HEAT STRESS MORTALITY
D A DUBOSE, J MCCREARY, and L SOWDERS (U S Army, Research Institute of Environmental Medicine, Natick, MA) Journal of Applied Physiology (ISSN 0161-7567), vol 59, Sept 1985, p 706-709 refs

A86-10103
ROLE OF HEMOGLOBIN P50 IN O2 TRANSPORT DURING NORMOXIC AND HYPOXIC EXERCISE IN THE DOG
P T SCHUMACKER, A J SUGGETT, P D WAGNER, AND J B WEST (California, University, La Jolla) Journal of Applied Physiology (ISSN 0161-7567), vol 59, Sept 1985, p 749-757 refs
(Contract NIH-HL-17731)

A86-10104* National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif
EXERCISE HYPERTHERMIA AS A FACTOR LIMITING PHYSICAL PERFORMANCE - TEMPERATURE EFFECT ON MUSCLE METABOLISM
S KOZLOWSKI, Z BRZEZINSKA, B KRUK, H KACIUBA-USCILKO, J E GREENLEAF (NASA, Ames Research Center, Moffett Field, CA, Polish Academy of Sciences Medical Research Center, Warsaw, Poland) et al Journal of Applied Physiology (ISSN 0161-7567), vol 59, Sept 1985, p 766-773 Research supported by the Polska Akademia Nauk refs

The effect of trunk cooling on the muscle contents of ATP, ADP, AMP, creatine phosphate (CrP), and creatine, as well as of glycogen, some glycolytic intermediates, pyruvate, and lactate were assessed in 11 fasted dogs exercised at 20 C on treadmill to exhaustion Without cooling, dogs were able to run 57 min, and their rectal (Tre) and muscle (Tm) temperatures increased to 41 8 and 43 0 C, respectively Cooling with ice packs prolonged the ability to run by 45 percent, and resulted in lower Tre (by 1 1 C) and Tm (by 1 2 C) Depletion of muscle content of total high-energy phosphates (ATP + CrP) and glycogen, and increases in contents of AMP, pyruvate, and lactate were lower in cooled dogs than in non-cooled dogs The muscle content of lactiate correlated positively with TM These results indicate that hypothermia accelerates glycolysis, and shifts the equilibrium between high- and low-energy phosphates in favor of the latter The adverse effect of hypothermia on muscle metabolism may be relevant to the limitation of endurance I S

A86-10107
CARDIAC RESPONSE OF SUBMAXIMAL EXERCISE IN DOGS SUSCEPTIBLE TO SUDDEN CARDIAC DEATH
G E BILLMAN (Oklahoma, University, Oklahoma City), P J SCHWARTZ (Ohio State University, Columbus), J P GAGNOL (Milano, Universita, Milan, Italy), and H L STONE Journal of Applied Physiology (ISSN 0161-7567), vol 59, Sept 1985, p 890-897 refs
(Contract NIH-HL-33718, NIH-HL-32230)

N86-10109* Marquette Univ , Milwaukee, Wis
RECOVERY IN SKELETAL MUSCLE CONTRACTILE FUNCTION AFTER PROLONGED HINDLIMB IMMOBILIZATION
R H FITTS and C J BRIMMER (Marquette University, Milwaukee, WI) Journal of Applied Physiology (ISSN 0161-7567), vol 59, Sept 1985, p 916-923 refs
(Contract NAG2-212)

The effect of three-month hindlimb immobilization (IM) in rats on contractile properties of slow-twitch soleus (SOL), fast-twitch extensor digitorum longus, and fast-twitch superficial region of the vastus lateralis were measured after 0, 14, 28, 60, and 90 days of recovery on excized, horizontally suspended muscles stimulated electrically to maximal twitch tension IM caused decreases in muscle-to-body weight ratios for all muscles, with no complete recovery even after 90 days The contractile properties of the fast-twitch muscles were less affected by IM than those of the slow-twitch SOL The SOL isometric twitch duration was shortened, due to reduced contraction and half-relaxation time, both of which returned to control levels after 14 days of recovery The peak tetanic tension, P(O), g/sq cm , decreased with IM by 46 percent in the SOL, but recovered by the 28th day The maximum shortening velocity was not altered by IM in any of the muscles Thus, normal contractile function could recover after prolonged limb IM I S

A86-10252
COMPARATIVE BIODYNAMIC RESPONSE OF TWO PRIMATE SPECIES TO THE SAME VIBRATIONAL ENVIRONMENT
A R SLONIM (USAF, Aerospace Medical Research Laboratory, Wright-Patterson AFB, OH) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol 56, Oct 1985, p 945-955
(Contract F33615-79-C-0509)

The impedance and transmissibility characteristics of primates undergoing vertical sinusoidal vibrations were studied and attempts were made to derive interspecies scaling laws to use the primate data to predict vibrational effects on humans Accelerometers were placed on the spines and seats of the monkeys and baboons, who were sedated when exposed to varying frequencies of g-forces of 0 177-0 283 Impedance magnitude and phase and transmissibility between the seat and two spinal accelerometers were calculated Both animal types were found to have vibrated out of phase with the seat The results from the Rhesus monkeys were more convergent to scale values which could be used for humans (and chimpanzees) than were the baboon data M S K

A86-10254
ELECTROCARDIOGRAPHIC CHANGES IN SERIOUS DECOMPRESSION SICKNESS
D R LEITCH and J M HALLENBECK (Institute of Naval Medicine, Alverstoke Gosport, England, U S Navy, Naval Medical Research Institute, Uniformed Services University of the Health Sciences, Bethesda, MD) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol 56, Oct 1985, p 966-971 refs
(Contract NAVY TASK M0099,PN001,1151)

Electrocardiographic changes observed in 21 dogs suffering from spinal cord decompression sickness (DCS) are described Changes seen included P wave peaking and P-R depression compatible with right heart strain, S-T segment and T wave changes suggestive of myocardial ischemia, and ventricular arrhythmias ranging from unifocal premature ventricular contractions to ventricular tachycardia Compression therapy did not always restore the ECG changes promptly to normality The changes are discussed in association with concurrent physiological events. These included pulmonary hypertension, systemic hypertension and hypotension, and cerebral DCS Possible mechanisms ranging from local cardiac DCS or coronary gas embolism to autonomic nervous system disturbances arising from cerebral and spinal cord DCS are reviewed It is concluded that ECG recordings should be made more often when treating clinical DCS Author

A86-10255
EFFECTS OF 100 PERCENT OXYGEN ON THE CARDIOVASCULAR RESPONSES TO VASOACTIVE COMPOUNDS IN THE DOG
J C SVENTEK and E J ZAMBRASKI (Rutgers University, New Brunswick, NJ) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol 56, Oct 1985, p 972-975 refs
(Contract NIH-HL-25255)

A86-10256
BIOLOGICAL PARAMETERS IN JAPANESE QUAIL GENETICALLY SELECTED FOR RESISTANCE OR SENSITIVITY TO AN ACUTE HYPOXIC SURVIVAL
H BARTELS (Hannover, Medizinische Hochschule, Hanover, West Germany), V GOURLET, M STUPFEL (Institut National de la Sante et de la Recherche Medical, Le Vesinet, France), A PERRAMON (Institut National de la Recherche Agronomique, Jouy en Josas, France), and M PIERRE (CNRS, Gif-sur-Yvette, France) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol 56, Oct 1985, p 976-984 refs

A86-11802
LIFE AT HIGH TEMPERATURES
T D BROCK (Wisconsin, University, Madison) Science (ISSN 0036-8075), vol 230, Oct 11, 1985, p 132-138 NSF-supported research refs

The types, molecular structure and metabolic activity of bacteria which can live at elevated temperatures, even beyond the boiling point of water, are discussed The upper temperature limit for life is known to reside between 110-250 C Prokaryotes can grow above 70 C, eukaryotes up to 60 C, and autotropic organisms above 73 C The latter exploit inorganic energy sources such as sulfide, elemental sulfur and ferrous iron Only members of the Archaebacteria live in regimes over 90 C Proteins with enhanced thermal stability have exhibited extra salt bridges between portions of the folded molecules, however, the protein forming mechanism is thought to be responsible for thermostability Several possible biotechnological applications of the high-temperature bacteria for industrial purposes are explored M S K

A86-12001* National Biomedical Research Foundation, Washington, D C
NEW PERSPECTIVES ON BACTERIAL FERREDOXIN EVOLUTION
D G GEORGE, L T HUNT, L-S L YEH, and W C BARKER (National Biomedical Research Foundation, Washington, DC) Journal of Molecular Evolution (ISSN 0022-2844), vol 22, no 1, 1985, p 20-31 refs
(Contract NASW-3954, NIH-GM-08710, NIH-RR-01821)

Ferredoxins are low-molecular-weight, nonheme, iron proteins which function as electron carriers in a wide variety of electron transport chains Howard et al (1983) have suggested that the amino end of Azotobacter vinelandii ferredoxin shows a greater similarity to the carboxyl end of ferredoxin from Chromatium vinosum and that their half-chain sequences are homologous when the half-chains of either species are considered in inverse order Examination of this proposition has made it necessary to reevaluate previous conclusions concerning the evolution of bacterial ferredoxin Attention is given to the properties of the bacterial ferredoxin sequences, and the evolution of the bacterial ferredoxins G R

A86-12002* State Univ of New York, Stony Brook
PHYLOGENETIC ORIGINS OF THE PLANT MITOCHONDRION BASED ON A COMPARATIVE ANALYSIS OF 5S RIBOSOMAL RNA SEQUENCES
E VILLANUEVA, N DELIHAS (New York, State University, Stony Brook), K R LUEHRSEN, G E FOX (Houston, University, TX), and J GIBSON (Cornell University, Ithaca, NY) Journal of Molecular Evolution (ISSN 0022-2844), vol 22, no 1, 1985, p 46-52 refs
(Contract NSF PCM-83-02-127, NSG-7440)

The complete nucleotide sequences of 5S ribosomal RNAs from Rhodocyclus gelatinosa, Rhodobacter sphaeroides, and Pseudomonas cepacia were determined Comparisons of these 5S RNA sequences show that rather than being phylogenetically related to one another, the two photosynthetic bacterial 5S RNAs share more sequence and signature homology with the RNAs of two nonphotosynthetic strains Rhodobacter sphaeroides is specifically related to Paracoccus denitrificans and Rc gelatinosa is related to Ps cepacia These results support earlier 16S ribosomal RNA studies and add two important groups to the 5S RNA data base Unique 5S RNA structural features previously found in P denitrificans are present also in the 5S RNA of Rb sphaeroides, these provide the basis for subdivisional signatures The immediate consequence of obtaining these new sequences is that it is possible to clarify the phylogenetic origins of the plant mitochondrion In particular, a close phylogenetic relationship is found between the plant mitochondria and members of the alpha subdivision of the purple photosynthetic bacteria, namely, Rb sphaeroides, P denitrificans, and Rhodospirillum rubrum Author

A86-12026* Maryland Univ , Baltimore
TESTOSTERONE AND MUSCLE HYPERTROPHY IN FEMALE RATS
F E KUHN and S R MAX (Maryland, University, Baltimore) Journal of Applied Physiology (ISSN 0161-7567), vol 59, July 1985, p 24-27 Research supported by the University of Maryland refs
(Contract NAG2-100)

The effects of chronic treatment with testosterone propionate (TP) on compensatory muscle hypertropy in female rats are examined The 48 female rats were placed in one of four test groups (1) no overload (synergist removal), no TP, (2) overload, no TP, (3) no overload + TP, and (4) overload + TP The technique used to administer the TP is described The preparation of the plantaris muscle, the analysis of pyruvate oxidation and the determination of malate and lactate dehydrogenases and the noncollogen protein are explained The results which reveal the effect of overload and TP on body weight, noncollogen protein concentration, lactate and malate dehydrogenase activities, and pyruvate oxidation are presented and discussed It is concluded that in terms of body weight, protein content, pyruvate, glycolysis,

and oxidative metabolisms chronic TP treatments do not change compensatory muscle hypertropy I F.

A86-12378
OPPOSING HEMODYNAMIC EFFECTS OF SUBSTANCE P ON PULMONARY VASCULATURE IN RABBITS
G S WORTHEN, R S GUMBAY, D T. TANAKA, and M M GRUNSTEIN (National Jewish Hospital and Research Center, Colorado, University, Denver) Journal of Applied Physiology (ISSN 0161-7567), vol 59, Oct 1985, p 1098-1103 refs
(Contract NIH-HL-25165)

The effects of substance P (SP) on rabbit pulmonary vasculature is investigated, and some of the mechanisms involved are elucidated The net response of the vasculature is found to be dose-dependent vasoconstriction. The vasoconstrictor response appears to be mediated in part by the generation of vasoconstrictor prostaglandins and thromboxanes A cholinergically mediated vasodilator which is activated by SP may well represent a neuromodulatory role of SP in acetylcholine release C D

A86-12380*
BIOCHEMICAL RESPONSE TO CHRONIC SHORTENING IN UNLOADED SOLEUS MUSCLES
S R JASPERS, J M FAGAN, and M E TISCHLER (Arizona Health Sciences Center, Tucson) Journal of Applied Physiology (ISSN 0161-7567), vol 59, Oct 1985, p 1159-1163 refs
(Contract NAGW-227, NIH-AM-28647)

One leg of tail-casted suspended rats was immobilized in a plantar-flexed position to test whether chronic shortening of posterior leg muscles affected the metabolic response to unloading The immobilized plantaris and gastrocnemius muscles of these animals showed approximately 20 percent loss of muscle mass in contrast to simply a slower growth rate with unloading Loss of mass of the soleus muscle during suspension was not accentuated by chronic shortening Although protein degradation in the isolated soleus muscle of the plantar-flexed limb was slightly faster than in the contralateral free limb, this difference was offset by faster synthesis of the myofibrillar protein fraction of the chronically shortened muscle Total adenine nucleotides were 17 percent lower (P less than 0 005) in the chronically shortened soleus muscle following incubation Glutamate, glutamine, and alanine metabolism showed little response to chronic shortening These results suggest that, in the soleus muscle, chronic shortening did not alter significantly the metabolic responses to unloading and reduced activity Author

A86-12381
RESPONSES OF BULBOSPINAL AND LARYNGEAL RESPIRATORY NEURONS TO HYPERCAPNIA AND HYPOXIA
W M ST JOHN and A L BIANCHI (Dartmouth College, Hanover, NH) Journal of Applied Physiology (ISSN 0161-7567), vol. 59, Oct 1985, p 1201-1207 Research supported by the Institut National de la Sante et de la Recherche Medicale and Ministere des Relations Exterieures refs
(Contract NIH-HL-20574)

A86-12382
CHANGES IN ANTIDROMIC LATENCIES OF MEDULLARY RESPIRATORY NEURONS IN HYPERCAPNIA AND HYPOXIA
A L BIANCHI and W M ST JOHN (Dartmouth College, Hanover, NH) Journal of Applied Physiology (ISSN 0161-7567), vol. 59, Oct 1985, p 1208-1213 Research supported by the Institut National de la Sante et de la Recherche Medicale and Ministere des Relations Exterieures refs
(Contract NIH-HL-20574)

A86-12520
WATER EXCRETION AND NATRIURETIC FUNCTION IN THE KIDNEYS OF RATS ADAPTED TO COLD [VODOVYDELITEL'NAIA I NATRIIURETICHESKAIA FUNKTSII POCHEK U KRYS PRI ADAPTATSII K KHOLODU]
T N ZAMAI (Krasnoiarskii Gosudarstvennyi Meditsinskii Institut, Krasnoyarsk, USSR) Fiziologicheskii Zhurnal SSSR (ISSN 0015-329X), vol 71, July 1985, p 809-812 In Russian refs

A86-12521
CATECHOLAMINE CONTENT OF SINGLE BRAIN NUCLEI IN AUGUST RATS FOLLOWING IMMOBILIZATION STRESS [KATEKHOLAMINY V IADRAKH MOZGA KRYS LINII AVGUST PRI IMMOBILIZATSIONNOM STRESSE]
T M. IVANOVA, T I BELOVA (AMN SSSR, Institut Normal'noi Fiziologii, Moscow, USSR), R KVETNANSKY, Z OPRSALOVA, and M DOBRAKOVOVA (Slovenska Akademia Vied, Ustav Experimentalnej Endokrinologie, Bratislava, Czechoslovakia) Fiziologicheskii Zhurnal SSSR (ISSN 0015-329X), vol 71, July 1985, p 823-828 In Russian refs

A86-12522
CHANGES IN THE VASCULAR FUNCTIONS OF SKELETAL MUSCLES DUE TO ACUTE HYPOTHERMIA [IZMENENIIA FUNKTSII SOSUDOV SKELETNOI MYSHTSY PRI OSTROI GIPOTERMII]
R R SHABAEV and IU A KUDRIASHOV (AMN SSSR, Nauchno-Issledovatel'skii Institut Eksperimental'noi Meditsiny, Leningrad, USSR) Fiziologicheskii Zhurnal SSSR (ISSN 0015-329X), vol 71, July 1985, p 882-888 In Russian refs

N86-10733# Committee on Energy and Commerce (U S House)
BIOTECHNOLOGY REGULATION
Washington GPO 1985 186 p Hearing before the Subcomm on Oversight and Invest of the Comm on Energy and Com , 98th Congr , 2nd Sess , 11 Dec 1984
(GPO-43-778) Avail Subcommittee on Oversight and Investigations

Testimony and hearings in support of biotechnology regulation. Before The Subcommittee On Oversight And Investigations Of The Committee On Energy And Commerce House Of Representatives are presented Special consideration is given to the regulation of genetic engineering B W

N86-10734*# National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif
LIFE SCIENCES RESEARCH ON THE SPACE STATION: AN INTRODUCTION
Sep 1985 18 p refs
(NASA-TM-86836, REPT-85408, NAS 1 15 86836) Avail NTIS HC A02/MF A01 CSCL 06B

The Space Station will provide an orbiting, low gravity, permanently manned facility for scientific research, starting in the 1990s The facilities for life sciences research are being designed to allow scientific investigators to perform research in Space Medicine and Space Biology, to study the consequences of long-term exposure to space conditions, and to allow for the permanent presence of humans in space This research, using humans, animals, and plants, will provide an understanding of the effects of the space environment on the basic processes of life. In addition, facilities are being planned for remote observations to study biologically important elements and compounds in space and on other planets (exobiology), and Earth observations to study global ecology The life sciences community is encouraged to plan for participation in scientific research that will be made possible by the Space Station research facility. Author

N86-10735# Federation of American Societies for Experimental Biology, Bethesda, Md.
LSRO/ONR AD HOC REVIEW PROCESS Annual Progress Report, 1 May 1984 - 30 Apr. 1985
13 Jun 1985 14 p
(Contract N00014-83-C-0196)
(AD-A156590) Avail NTIS HC A02/MF A01 CSCL 06A

This annual progress report covers the ad hoc review process Efforts are continuing to increase the number of peer reviewers who are experienced in the LSRO/ONR review process The LSRO/FASEB Proposal Rating Form, the form used for the ad hoc peer review evaluation activity, has been reorganized so that it can, if required, be used by all programs of the Biological Sciences Division The LSRO Oversight Panel on the Office of Naval Research Molecular Biology Program has continued to function with further refinement In performing evaluations of certain aspects of the Molecular Biology Program, selected members of the LSRO Oversight Panel attended a meeting with selected contractors of the Molecular Biology Program whose research focuses on biotechnology and protein engineering Non-contract Activities, Contract Problems Encountered and Resolved, Review Process Time, Contract Modifications, LSRO Oversight Panel Reorganization are discussed GRA

N86-10736# Edgerton, Germeshausen and Grier, Inc , Idaho Falls, Idaho
KINETICS OF BIOLOGICAL FERROUS IRON OXIDATION
P I WICHLACZ and H OLEM 1985 15 p refs Presented at the 114th AIME Ann Meeting, New York, 24 Feb 1985, sponsored in cooperation with Society of Mining Engineers Prepared in cooperation with Tennessee Valley Authority, Chattanooga
(Contract DE-AC07-76ID-01570)
(DE85-014616, EGG-M-27484, CONF-850211-12) Avail NTIS HC A02/MF A01

A mathematical model of growth and ferrous iron oxidation for attached bacteria was applied to rotating biological contactor (RBC) units treating acidic mine drainage The model describes attached bacterial growth as a saturation function, where the rate of substrate utilization is determined by a maximum substrate oxidation rate constant, a half saturation constant, and the concentration of substrate within the RBC The maximum oxidation rate constant was proportional to flow rate and the substrate concentration in the reactor varied with influent substrate concentration The model was tested at three separate sites and with three different size RBC units The ability of the model to predict the rate of iron oxidation under all test conditions was significant The accuracy of the model was found to be affected by unit size and vary with specific test site DOE

N86-10737# Lawrence Livermore National Lab , Calif
SOMATIC CELL AND MOLECULAR GENETICS APPROACH TO DNA REPAIR AND MUTAGENESIS
L H THOMPSON 14 Jun 1985 10 p Presented at the 4th Intern Conf on Environ Mutagens, Stockholm, 24 Jun 1985
(Contract W-7405-ENG-48)
(DE85-014181, UCRL-92834, CONF-8506137-4) Avail NTIS HC A02/MF A01

In the CHO cell line, UV-sensitive mutants representing five genetic complementation groups were identified Mutants from each of these groups were shown to be defective in performing the incision step of repair after exposure to UV It is questioned whether the large number of complementation groups of xeroderma pigmentosa mutations of these groups all correspond to single gene loci The same issue applies to the five groups of UV-sensitive CHO mutants The human karyotype of the genes that complement the defects in the CHO mutants were localized By marking CHO/human cell hybrids under the appropriate selective conditions, each of the complementing human genes are mapped The mutation in strain UV20 (Group 2) was complemented by human chromosome 19 Preliminary evidence suggests that UV5 may also be complemented by human chromosome 19 while each of the other 3 groups involves a different human chromosome Mutant EM9 is also complemented by a gene on chromosome 19 DOE

N86-10738# Joint Publications Research Service, Arlington, Va
USSR REPORT: LIFE SCIENCES. BIOMEDICAL AND BEHAVIORAL SCIENCES
18 Sep 1985 103 p Transl into ENGLISH from various Russian articles
(JPRS-UBB-85-023) Avail NTIS HC A06

Progress in research in the life sciences, with emphasis on biomedical and behavioral sciences is reported Topics discussed include aerospace medicine, biotechnology, military medicine, nonionizing electromagnetic radiation effects, and physiology

N86-10741# Joint Publications Research Service, Arlington, Va
ROMANIAN PLANT PRODUCES PROTEIN CONCENTRATE FROM PARAFFIN-NOURISHED YEASTS
In its USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 17-18 18 Sep 1985 Transl into ENGLISH from Nauka i Tekhn (Riga), no 6, May 1985 p 28-29
Avail NTIS HC A06

Protein concentrate production from paraffin nourished yeasts is reported Abioprotein plant converts candida type yeasts microorganisms into flour which contains protein concentrate used on cattle and animal feed The culture growth medium contains sulfates and phosphates Paraffin supplies the carbon essential to the microorganisms' viability The development of a technology to produce proteins from methanol is considered E A K

N86-10742# Joint Publications Research Service, Arlington, Va.
BIOTECHNOLOGY: SCIENCE AND PRACTICE
A ILYALETDINOV *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 19-21 18 Sep 1985 Transl into ENGLISH from Kazakhstansk Pravda (Alma-Ata), Jun 1985 p 3
Avail NTIS HC A06

The development of scientific research and the introduction of biotechnology's achievements into production are discussed The development of an antibiotics industry, based upon the use of pure microorganism cultures under sterile conditions, and a microbiological industry, producing feed protein for animal husbandry and microbiological means for fighting agricultural pests is outlined Industrial microbiology is related A technology for culturing feed yeasts directly in feed shops by using media containing starch preliminary subjected to fermentation with the malt of germinated grain--barley or other cereal grains is proposed The method of fermenting starch-containing stock with malt amylase, is turned into feed production Special species of yeast, produced by our staff members, are used to obtain the feed protein The contributions of microbiology and virology to the development of biological Science and Scientific and technical progress are outlined E A K

N86-10754# Joint Publications Research Service, Arlington, Va
SHORT TERM HEAT EFFECT ON ADRENO- AND CHOLINO-SENSITIVITY OF RAT'S SMALL INTESTINE Abstract Only
K A MEZIDOVA, B N MANUKHIN, and F F SULTANOV *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 70 18 Sep 1985 Transl into ENGLISH from Fiziol Zh SSSR Im I M Sechenov (Leningrad), v 71, no 2, Feb 1985 p 195-199
Avail NTIS HC A06

The dynamics of adreno and choline sensitivity of the smooth muscles of rat's small intestine were studied at various times after exposure to 45 C for 30 or 60 minutes The body temperature of test animals increased rapidly under the influence of the external temperature Sensitivity of the intestine to noradrenaline also increased under conditions of hyperthermia, following the pattern of body temperature Sensitivity of acetylcholine was less initial heating resulted in a slight decrease followed by an increase after a 1 hr exposure, after termination of the experiment, the sensitivity remained below that of control values for about 5 days It is

shown that changes in adrenoreceptor sensitivity could be controlled by the altering of environmental temperature E A K

N86-10760# Joint Publications Research Service, Arlington, Va
REACTION OF RABBIT RESPIRATION SYSTEM TO HYPOXIC STIMULUS IN NITROGEN-OXYGEN MEDIUM AT ELEVATED PRESSURE Abstract Only
Z A DONINA *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 75 18 Sep 1985 Transl into ENGLISH from Fiziol Zh SSSR Im. I M Sechenov (Leningrad), v 71, no 3, Mar 1985 p 316-319 Original language document announced in IAA as A85-33968
Avail NTIS HC A06

Respiratory changes in exposed animals to increasing hypoxia was investigated on rabbits under normal conditions and in nitrogen-oxygen mixture at elevated pressure While remaining at atmospheric pressure in air, the oxygen pressure in arterial blood dropped gradually during recycled breathing from a bag, resulting in hyperventilation The largest increase in respiratory volume is observed when oxygen pressure in blood drops to 44.9 mm Hg, this occurred while the respiration becomes deeper and more frequent During hyperbaria, the requency of breathing decreases while the depth of the respiration increases The increase in respiratory volume and lung ventilation is accompanied by increased pressure in the lungs and by more labored breathing
E A K

N86-10761# Joint Publications Research Service, Arlington, Va.
INDICES OF BLOOD OXYGEN TRANSPORTING PROPERTIES AND ERYTHROPOIESIS IN RATS AFTER PROLONGED STAY IN NITROGEN-OXYGEN MIXTURE AT ELEVATED PRESSURE Abstract Only
A M VOLZHSKAYA, G V TROSHIKHIN, and T Y SHUMILOVA *In its* USSR Rept Life Sci. Biomed and Behavioral Sci. (JPRS-UBB-85-023) p 76 18 Sep 1985 Transl into ENGLISH from Fiziol Zh SSSR Im I M. Sechenov (Leningrad), v 71, no 3, Mar 1985 p 320-323
Avail NTIS HC A06

Principal blood indices determining the oxygen transport properties and the intensity of erythropoiesis in rats exposed for different times to elevated pressure in a mixed nitrogen-oxygen atmosphere were investigated. After decompression, the animals showed increased concentration of hemoglobin, elevated levels of hematocrit and higher quantities of erythrocytes, which persisted for 4 hrs, after 24 hrs the values returned to normal The concentration of 2,3-diphosphoglycerate in erythrocytes increased and remained that way for 72 hrs The erythropoietic activity was intensified through the 72 hrs Mechanisms aimed at improving delivery of oxygen to the tissue and representing compensatory reactions to hypoxia are indicated E A K

N86-10762# Joint Publications Research Service, Arlington, Va.
HOMOCARNOSIN IN RAT BRAIN DURING ADAPTATION TO COLD Abstract Only
T I BONDARENKO, A A. KRICHEVSKAYA, and G N KOSHCHIY *In its* USSR Rept: Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 76 18 Sep 1985 Transl into ENGLISH from Fiziol. Zh. SSSR Im I M Sechenov (Leningrad), v 71, no 3, Mar 1985 p 333-336
Avail NTIS HC A06

Homocarnosin (gamma-aminobutyryl-1-histidine) is a peptide neuromediator of the central nervous system, its content in white rate brain was studied during cold adaptation process lasting from 1 to 45 days It was shown that the homocarnosin level dropped progressively with exposure to this temperature. During the stress period, peroxide oxidation intensified and the hemoglobin in serum was elevated Stimulation of the peroxide oxidation damaged some enzymes and the structure of the membranes and some of their properties were altered Adaptation time to the cold varied in different animals. At that time the level of homocarnosin in cold-adapted animals was 56% lower than controls The exposure to low temperature led to decrease in homocarnosin-carnosynthetase activity which explained the lower levels of homocarnosin in cold adapted animals E A K

N86-10763# Joint Publications Research Service, Arlington, Va.
EFFICIENCY OF MUSCULAR WORK IN WHITE RATS DURING ADAPTATION TO COLD Abstract Only
Y Y TKACHENKO and M. A YAKIMENKO *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 77 18 Sep 1985 Transl into ENGLISH from Fiziol Zh SSSR Im I M Sechenov (Leningrad), v 71, no 3, Mar 1985 p 337-341
Avail NTIS HC A06

The relationship between heat production and muscle work performed under various work loads by adult rats adapted to a cold medium was investigated to determine the maximum of work ability and its energetic optimum Temperature increase in the contracting muscle per unit work (delta/A) was plotted as a function of the magnitude of completed work by cold-adapted and control rats It is shown that work effectiveness changed with adaptation in cold optimum performance was achieved by cold adapted animals with loads of 200 to 250 g as compared to controls which showed a 320 to 380 g loads E A K

N86-10764# Joint Publications Research Service, Arlington, Va
INTRADIURNIAL ORGANIZATION OF WAKEFULNESS-SLEEP SEQUENCE AND ENERGY METABOLISM IN RATS EXPOSED TO LOW AMBIENT TEMPERATURE Abstract Only
V S SAZONOV and Y F PASTUKHOV *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 77 18 Sep 1985 Transl into ENGLISH from Fiziol Zh SSSR Im I M Sechenov (Leningrad), v 71, no 3, Mar 1985 p 342-347 Original language document announced in IAA as A85-36611
Avail NTIS HC A06

Sleep characteristics were studied as a function of energy exchange under conditions of acute and chronic exposure to low ambient temperature Two sleep phases were identified in all animals regardless of the temperature, (1) slow wave sleep, further subdivided into surface and deep subgroups, and (2) paradoxial sleep Three control rats were used and five cold-adapted ones At low ambient temperature, controls had a lighter, shorter and often interrupted sleep. After cold adaptation daily sleeping period increased both at low and ambient temperatures It is assumed that after prolonged cold the sleep initiation mechanisms continue to be active, while those of the sleep development arrested
E A K

N86-10766# Joint Publications Research Service, Arlington, Va
EFFECT OF COLD ON BRAIN SEROTONIN SYSTEM AND PLASMA CORTICOSTEROID LEVEL IN DIFFERENT STRAINS OF MICE Abstract Only
L A KORYAKINA, A V KULIKOV, M Y FIGUROVA, and N K POPOVA *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 78-79 18 Sep 1985 Transl into ENGLISH from Fiziol. Zh SSSR Im I M Sechenov (Leningrad), v 71, no. 3, Mar 1985 p 422-427
Avail NTIS HC A06

The activity of tryptophan hydroxylase in brain and was evaluated the plasma corticosteroid levels in male mice while exposed to +4 C for 1 or 6 hrs. It is shown that the activity of tryptophan hydroxylase dropped during the cooling process, and it is assumed that the activity of the entire serotonin system in brain lowered Decreased synthesis of serotonin supported temperature homeostasis and increased the resistance of animals to cold The changes in the serotonin system were of an adaptive nature No linear relationship is noted between the degree of activation of hypothalamo-hypophyseal-adrenal systems and the drop in body temperature of the experimental animals It is assumed that the observed changes in the synthesis of biogenic amine represent a specific reaction of the body to the cooling process and are caused by participation of brain serotonin in central thermoregulation E A.K

N86-10767# Joint Publications Research Service, Arlington, Va
DYNAMICS OF GENERAL RESISTANCE OF RATS DURING READAPTATION PERIOD AFTER TRAINING IN ALTERED GAS ENVIRONMENT Abstract Only
Y Y ZVERKOVA *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 79 18 Sep 1985 Transl into ENGLISH from Fiziol Zh SSSR Im I M Sechenov (Leningrad), v 71, no 4, Apr 1985 p 523-526
Avail NTIS HC A06

The duration of retained resistance of animals to external conditions was studied on 330 white rats as a function of adaptive training and specific conditions of altered gas medium The adaptation training to combined hypoxia and hypercapnia or to pure hypoxia lasted 15 and 30 days for each modality It was shown that a 15-day training by either of above methods had an insignificant effect on high altitude resistance The animals exposed to 30 day treatment showed significant increase in resistance to acute hypoxia The high altitude resistance was higher at all times in the groups exposed to a combination of hypoxia and hypercapnia training This type of resistance lasted for up to 60 days after thre readaptation period E A K

N86-11829*# Wisconsin Univ, Madison Dept of Horticulture
CONTROLLED ENVIRONMENT LIFE SUPPORT SYSTEM: CALCIUM-RELATED LEAF INJURIES ON PLANTS Final Report, May 1981 - Apr. 1984
T W TIBBITTS 1985 44 p refs
(Contract NCC2-136)
(NASA-CR-176288, NAS 1 26 176288) Avail NTIS HC A03/MF A01 CSCL 06C

A calcium related injury in lettuce termed tipburn was the focus of this study It affects the young developing leaves as they become enclosed during head formation It is a good model system to study because the injury can be induced with good predictability and lettuce is one of the crops chosen by the CELSS program for concentrated study Investigations were undertaken to study a number of different procedures, that would have the potential for encouraging movement of calcium into the young developing leaves and to study the time course and pattern of calcium accumulation in developing leaves to provide a basis for developing effective control procedures for this injury Author

N86-11830*# Massachusetts Inst of Tech, Cambridge Dept of Applied Biological Science
UTILIZATION OF NON-CONVENTIONAL SYSTEMS FOR CONVERSION OF BIOMASS TO FOOD COMPONENTS: POTENTIAL FOR UTILIZATION OF ALGAE IN ENGINEERED FOODS Annual Report
M KAREL, A R KAMAREI, and Z NAKHOST Mar 1985 37 p refs
(Contract NCC2-231)
(NASA-CR-176257, NAS 1 26 176257) Avail NTIS HC A03/MF A01 CSCL 06C

The major nutritional components of the green algae (Scenedesmus obliquus) grown in a Constant Cell density Apparatus were determined Suitable methodology to prepare proteins from which three major undesirable components of these cells (i e, cell walls, nucleic acids, and pigments) were either removed or substantially reduced was developed Results showed that processing of green algae to protein isolate enhances its potential nutritional and organoleptic acceptability as a diet component in a Controlled Ecological Life Support System Author

N86-11831*# San Francisco Univ, Calif
STRUCTURE AND FUNCTION OF ISOZYMES: EVOLUTIONARY ASPECTS AND ROLE OF OXYGEN IN EUCARYOTIC ORGANISMS Final Report
T SATYANARAYANA Sep 1985 11 p refs
(Contract NCC2-85)
(NASA-CR-176286, NAS 1 26 176286) Avail NTIS HC A02/MF A01 CSCL 06C

Oxygen is not only one of the most abundant elements on the Earth, but it is also one of the most important elements for life In terms of composition, the feature of the atmosphere that most distinguishes Earth from other planets is the presence of abundant amounts of oxygen The first forms of life may have been similar to present day anaerobic bacteria such as clostridium The relationship between prokaryotes and eukaryotes, if any, has been a topic of much speculation With only a few exceptions eukaryotes are oxygen-utilizing organisms This research eukaryotes or eukaryotic biochemical processes requiring oxygen, could have arisen quite early in evolution and utilized the small quantities of photocatalytically produced oxygen which are thought to have been present on the Earth prior to the evolution of massive amounts of photosynthetically-produced oxygen B W

N86-11832# Army Research Inst of Environmental Medicine, Natick, Mass
AN ATROPINIZED HEAT-STRESSED RAT MODEL: ANTICHOLINERGIC AND ANTICHOLINESTERASE DRUG POTENCY
C B MATTHEW, R W HUBBARD, and R P FRANCESCONI Jul 1985 18 p
(Contract DA PROJ 3M1-62734-A-875)
(AD-A157620, USARIEM-M-34/85) Avail NTIS HC A02/MF A01 CSCL 06O

We have developed an animal model to evaluate the thermoregulatory effects of several anticholinergic drugs, particularly in hot environments Our previous work on this model demonstrated that atropine, the prototype of muscarinic anticholinergic drugs, produces a dose-dependent increase in heating rate of heat-stressed rats that lasted for 3 hours after administration By comparing the effects on heating rate of other anticholinergic drugs relative to the effects of atropine, we derived the following potency ratios imipramine (0 004), amitriptyline (0 02), chlorpromazine (0 1), atropine (1), L-hyoscymaine (2), atropine methyl nitrate (4), and scopolamine (16) Additionally, we tested the ability of carbamates to reduce the elevated heating rate of atropinized rats as a measure of anticholinesterase efficacy, resulting in the following relative potencies neostigmine (8), physostigmine (2) and pyridostigmine (1) Our results indicate that this is a useful model to evaluate potential drug-exacerbated increases in body temperature in hot environments GRA

N86-11833# Oak Ridge National Lab, Tenn
POSITIVE GENETIC HAZARD PREDICTIONS FROM SHORT-TERM TESTS HAVE PROVED FALSE FOR RESULTS IN MAMMALIAN SPERMATOGONIA WITH ALL ENVIRONMENTAL CHEMICALS SO FAR TESTED
W L RUSSELL 1985 9 p refs Presented at the 4th Intern Conf on Environ Mutagens, Stockholm, 24 Jun 1985
(Contract DE-AC05-84OR-21400)
(DE85-013640, CONF-8506137-1) Avail NTIS HC A02/MF A01

Eleven chemicals for which there has been considerable human exposure were studied by the mouse specific-locus method because of their positive mutagenic action in other test systems All were positive in the Drosophila sex-linked recessive lethal test, and in mammalian somatic cells proved muagenic In mouse stem-cell spermatogonia none of the chemicals, even at maximum tolerated dose, has given a specific-locus mutation frequency higher than the control, and the mutation frequency for all eleven combined (12 mutations in 298,502 offspring) was actually less than the historical control Absence of mutation induction cannot be attributed to (1) failure of the chemicals to reach the testis (10 of them are known to reach the testis in active form), (2) small sample size (the samples are large), and (3) insensitivity of

the test (the test is not insensitive, a positive control gave a mutation frequency 132 times higher than the historical control) It is concluded that mammalian stem-cell spermatogonia have an effective repair capability DOE

N86-11834# Lawrence Livermore National Lab , Calif
DETECTION OF CHROMOSOMAL ABNORMALITIES IN HUMAN SPERM
B BRANDRIFF, L GORDON, A K ASHWORTH, G WATCHMAKER, and A V CARRANO 19 Jun 1985 9 p refs Presented at the 4th Intern Conf. on Environ Mutgens, Stockholm, 24 Jun 1985
(Contract W-7405-ENG-48)
(DE85-014178, UCRL-92835, CONF-8506137-3) Avail NTIS HC A02/MF A01

A new technology developed by Rudak, et al , for examining the chromosomal constitution of human sperm through fusion with eggs from the Syrian hamster was used to obtain baseline data on the types and frequencies of aberrations in sperm of normal men The frequency of structural aberrations in 2724 sperm chromosome karyotypes from the 13 healthy non-exposed donors ranged from 2 to 15 8%, demonstrating significant interindividual variability The most frequently occurring aberrations were chromosome breaks, followed by acentric fragments, chromatid exchanges, chromatid breaks, dicentrics and translocations, chromosome deletions and duplications, inversions, and chromatid deletions Two donors previously reported had one cell each with multiple chromatid exchanges and breaks In addition, the oldest donor, AA, had 5 cells out of 124 examined with multiple breaks and rearrangements too extensive to completely identify DOE

N86-11835# Oak Ridge National Lab , Tenn
RELATIONSHIP BETWEEN ALKYLATION SITES AND INDUCTION OF DOMINANT LETHALS AND HERITABLE TRANSLOCATIONS IN MICE
W M GENEROSO 1985 8 p refs Presented at the 4th Intern Conf on Environ Mutagens, Stockholm, 24 Jun 1985
(Contract DE-AC05-84OR-21400)
(DE85-014309, CONF-8506137-6) Avail NTIS HC A02/MF A01

Production of dominant lethals and heritable translocations is determined by the degree of stability of alkylation products within the chromosome If repair is not effected in the fertilized eggs and the alkylation products persist to the time of pronuclear chromosome replication or early cleavage divisions, they lead to chromatid-type aberrations and eventually to lethality The production of heritable translocations requires a transformation of unstable alkylation products into suitable intermediate lesions These lesions are converted into chromosome exchanges prior to the time of pronuclear chromosome replication Dominant lethals result from both chromatid and chromosome-type aberrations while heritable translocations results primarily from the latter type It is inherent that the production of chromosome and chromatid-type aberrations by a chemical mutagen are not necessarily mutually exclusive E A K

N86-11836# Oak Ridge National Lab , Tenn
INFORMATION FROM SPECIFIC-LOCUS MUTANTS ON THE NATURE OF INDUCED AND SPONTANEOUS MUTATIONS IN THE MOUSE
L B RUSSELL 1985 12 p refs Presented at 4th Intern Conf on Environ. Mutagens, Stockholm, 24 Jun 1985
(DE85-014313, CONF-8506123-7) Avail: NTIS HC A02/MF A01

Genetic and molecular analyses of mutations are increasing the qualitative capabilities of the specific-locus test (SLT) Some mutations are found to be deletions of large numbers of genes, including some that control survival at various developmental stages, neurological functions, enzyme syntheses, etc. Smaller (including possibly single-gene) deletions are also detected A third group of SLT mutations represents intragenic lesions For at least three of the loci, mutations may now be qualitatively grouped on the basis of simple phenotypic findings Type of mutagen and germ-cell stage exposed strongly influence the nature of the lesions The qualitative information from SLT results makes possible conclusions about relative potential harmfulness of different types of exposures that may yield equal mutation rates, about difference between induced and spontaneous mutations, etc It also identifies genetic material suitable for basic studies DOE

N86-11837# Tulsa Univ , Okla
TERATOGENIC EFFECTS OF MICROWAVE RADIATION Final Report, 1980 - 1985
M E OCONNOR and R STRATTAN May 1985 51 p
(Contract EPA-68-02-3453)
(PB85-207462, EPA-600/1-85-007) Avail NTIS HC A04/MF A01 CSCL 06T

Pregnant CF-1 mice was exposed to 2450-MHz CW microwave irradiation at power densities of 0, 10, or 30 mW/sq cm for 6 hours daily from gestational day 1 through day 18 All exposures occurred in an anechoic chamber maintained at 50% relative humidity with air temperature of 22C A group of pregnant colon cage-control mice was maintained for each of the three exposure groups Teratogenic examinations were performed on day 18 following Caesarean section of the maternal subject Every third fetus was stained with alazarin red and examined for skeletal abnormalities No significant differences between the groups observed for fetal body mass, fetal brain mass, resorption, live fetuses, gross abnormalities, or skeletal abnormalities
Author (GRA)

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AEROSPACE MEDICINE

Includes physiological factors, biological effects of radiation, and weightlessness

A86-10105
CONTROL OF EXERCISE HYPERPNEA DURING HYPERCAPNIA IN HUMANS
C -S POON and J G GREENE (North Dakota State University, U S Veterans Administration Hospital, Fargo, North Dakota, University, Grand Forks) Journal of Applied Physiology (ISSN 0161-7567), vol 59, Sept 1985, p 792-797 Research supported by the American Heart Association refs
(Contract NIH-HL-30794, NIH-RR-02142)

CO2-exercise interaction during exercise under controlled hypercapnia was examined in terms of ventilatory responses in eight male subjects during four sequential 5 min incremental treadmill runs from rest up to a maximum CO2 output, V(CO2) Arterial isocapnia was maintained by continual adjustment of the inspired P(CO2) The response in total ventilation, V(E), to exercise V(CO2) was linear at all levels of arterial P(CO2) Hypercapnia resulted in corresponding increases in both the slope and the intercept of the V(E)-V(CO2) curve, that were directly proportional to the rise in arterial P(CO2) Thus, concomitant hypercapnia and exercise affect the ventilatory response synergistically, suggesting positive interaction between these stimuli The increased exercise sensitivity in hypercapnia is qualitatively consistent with the hypothesis that V(E) is controlled to minimize the conflicting challenges due to chemical drive and the mechanical work of breathing (Poon, 1983) I S

A86-10106
ENHANCED METABOLIC RESPONSE TO CAFFEINE IN EXERCISE-TRAINED HUMAN SUBJECTS
J LEBLANC, M JOBIN, J COTE, P SAMSON, and A LABRIE (Universite, Laval, Quebec, Canada) Journal of Applied Physiology (ISSN 0161-7567), vol 59, Sept 1985, p 832-837 refs

The effect of caffeine on resting metabolic rate (RMR) was investigated in eight trained and eight nontrained young male subjects The ingestion of 4 mg/kg caffeine produced a greater increase of RMR in trained subjects This effect was associated with a greater increase in plasma free fatty acids and a larger fall

in respiratory quotient, indicating an enhanced lipid oxidation following caffeine in exercise-trained subjects An initial fall in plasma glucose was observed but only in trained subjects, and caffeine did not change plasma insulin in either group studied Caffeine caused a significant fall in plasma norepinephrine and an increase in plasma epinephrine in both groups of subjects, but this action was significantly greater in trained subjects It is suggested that the greater increase in RMR observed in trained subjects following caffeine ingestion is related to an enhanced lipid mobilization possibly produced by a greater epinephrine secretion and by subsequent increased lipid oxidation Author

A86-10108
HEADACHE AT HIGH ALTITUDE IS NOT RELATED TO INTERNAL CAROTID ARTERIAL BLOOD VELOCITY
J T REEVES, L G MOORE, R E MCCULLOUGH, R G MCCULLOUGH, G HARRISON (Colorado, University, Denver, Colorado State University, Fort Collins) et al Journal of Applied Physiology (ISSN 0161-7567), vol 59, Sept 1985, p 909-915 refs
(Contract NIH-HL-14985)

Internal carotid blood velocity (CBV) was measured by the Doppler ultrasound technique at 1600 m (Denver), and repeatedly up to 7 h at a simulated (430 Torr) altitude of 4800 m, in 6 subjects known to be susceptible to altitude-causing headaches (HA group) and in 6 other subjects without such history (C group) During the measurements of hypercapnic response in Denver, CBV was shown to increase linearly with end-tidal PCO2, confirming that the Doppler method could demonstrate an increase All six subjects in the HA group developed severe headache at 4800 m, whereas in the control group, four subjects remained well, and two others developed moderate headache CBV at 4800 m did not correlate with symptom development, arterial O2 saturation, or end-tidal P(CO2) In addition, neither CBV nor blood pressure were consistently elevated above the Denver baseline values Thus, the cerebral blood flow does not appear to play a primary role in causing headache symptoms at high altitude I S

A86-10110
LACTATE, PYRUVATE, AND LACTATE-TO-PYRUVATE RATIO DURING EXERCISE AND RECOVERY
K WASSERMAN, W L BEAVER, J A DAVIS, J-Z PU, D HEBER (California, University, Los Angeles and Torrance) et al Journal of Applied Physiology (ISSN 0161-7567), vol 59, Sept 1985, p 935-940 refs
(Contract NIH-HL-11907)

A86-10111
PLASMA LEVELS OF RENIN, ANGIOTENSIN II, AND 6-KETOPROSTAGLANDIN F1-ALPHA IN ENDURANCE ATHLETES
R FAGARD, R GRAUWELS, D GROESENEKEN, P LIJNEN, J STAESSEN (Leuven, Katholieke Universiteit, Louvain, Belgium) et al Journal of Applied Physiology (ISSN 0161-7567), vol 59, Sept 1985, p 947-952 FNRS-supported research refs

A86-10251
AIRLINE PILOT DISABILITY - THE CONTINUED EXPERIENCE OF A MAJOR U.S. AIRLINE
G W HOLT, W F TAYLOR, and E T CARTER (Mayo Clinic, Mayo Foundation, Rochester, MN) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol 56, Oct 1985, p 939-944 refs

A statistical analysis is carried out of the results of pilot pre-employment screening by airline medical departments, along with a survey of the change of pilot disability rates over time The survey covers 1832 pilots over the period 1975 to the end of 1982, including 368 pilots who underwent pre-employment screening Of the screened pilots, 45 were unacceptable due to psychological reasons, 28 for nonpsychological characteristics Cardiovascular diseases were the greatest cause of disability, indicating that attention be given to hyperlipidemia, smoking, glucose intolerance, hypertension and genetic background during screening The study also revealed that the disability rates have decreased over time, although the cause(s) for the decrease(s) was not identified M S K

A86-10253
PERFORMANCE AND PHYSIOLOGICAL EFFECTS OF ACCELERATION-INDUCED (+GZ) LOSS OF CONSCIOUSNESS
J O HOUGHTON, D K MCBRIDE, and K HANNAH (U S Navy, Naval Air Development Center, Warminster, PA, U S Navy, Naval Aerospace Medical Research Laboratory, Pensacola, FL) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol 56, Oct 1985, p 956-965 refs

Eight humans underwent centrifugal tests in an experiment designed to quantify the levels of pilot performance skills during the three stages of loss of consciousness (LOC) recovery The stages are unconsciousness, relative incapacitation, and normalization Extensive physiological, sensory and audio instrumentation were used to monitor the subjects before, during and after centrifuge sessions which featured steadily increasign g-levels from 0 067-8 0 g The subjects were required to perform spatial and verbal information processing tasks and produce vocal and motor responses LOC occurred at 5.0-8 0 g The results indicated that pilots will not reach normal performance levels for 2-3 min after recovery from LOC No correlations were found between g-tolerance and LOC recoverability M.S K

A86-10257* National Aeronautics and Space Administration Johnson (Lyndon B) Space Center,
CARDIOVASCULAR DECONDITIONING DURING SPACE FLIGHT AND THE USE OF SALINE AS A COUNTERMEASURE TO ORTHOSTATIC INTOLERANCE
M W BUNGO, J B CHARLES, and P C JOHNSON, JR (NASA, Johnson Space Center, Houston, TX) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol 56, Oct 1985, p 985-990 refs

Results are reported of trials with oral hydration by astronauts before reentry of the Orbiter The experiments were run to evaluate hydration as a means of offsetting the loss of lower body negative pressure experienced after several days in space The rehydration was carried out by 17 astronauts who ingested salt tablets and water prior to the end of the first eight STS mission orbital phases, nine astronauts abstained Pulse and blood pressure data were collected from 1-2 hr post landing Measurements were also made of the extent of cardiac deconditioning and the response to orthostatic stress (standing) Ingestion of the salt tablets reduced the heart rate response to stress an average of 29 percent The statistical significance of the difference has encouraged adoption of the salt tablet countermeasure as an operational procedure by Shuttle astronauts M S K

A86-10259
SERUM LEVELS OF ELEVEN STEROID HORMONES FOLLOWING MOTION SICKNESS
G K STALLA, H G DOERR, F BIDLINGMAIER, W G SIPPEL, and W VON RESTORFF (Luftwaffe, Flugmedizinisches Institut, Fuerstenfeldbruck, Muenchen, Universitaet, Munich, Kiel, Universitaet, West Germany) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol 56, Oct 1985, p 995-999. refs

Fifteen blindfolded male subjects were subjected to motion sickness-inducing trials in a study of the relationship between steroid hormonal responses and the severity of motion sickness (MS) The subjects executed upper body movements while rotating on a Baranyi chair at 72 deg/sec Symptoms were recorded every 2 min in trials lasting up to 30 min to a point of intolerance Blood samples were taken with a cannula inserted into the antebrachial vein The levels of 11 hormones were monitored and the subjects were ranked in three groups according to MS tolerance The rapid rise of hormones such as androstendione and 11-deoxycortisol in response to short exposure to MS-inducing situations showed promise as valid indicators of the severity of MS intolerance M S K

A86-10262
CALCIFIED HEMATOMA OF THE GREATER OMENTUM IN AN F-15 FIGHTER PILOT
P D HATTON and F J HARFORD, JR (USAF, Wilford Hall Medical Center, Lackland AFB, TX) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol 56, Oct. 1985, p 1009, 1010 refs

A high performance aircraft test pilot who presented with acalculous cholecystitis was found to have a calcified omental hematoma adjacent to the gallbladder Omental hematomas have not previously been linked to flight in high performance aircraft Current prevailing hypotheses regarding etiologies of omental hematomas include rapid blood flow shifts and venous fragility Forces encountered in high performance aircraft may increase the chance of omental hemorrhage Author

A86-10695
THERMOVISUAL INDICATORS OF BRAIN REACTIONS TO VISUAL STIMULI [TEPLOVIZIONNYE POKAZATELI REAKTSII MOZGA NA ZRITEL'NYE RAZDRAZHENIIA]
I A SHEVELEV, E N TSYKALOV, A M GORBACH, K P BUDKO, and G A SHARAEV (AN SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neirofiziologii, Moscow, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 11, July-Aug 1985, p. 538-543 In Russian refs

A noninvasive thermovisual method was used to detect thermal reaction in the occitoparietal area of human brain cortex to stimulation of the eye with light from a photostimulator The temporal, spatial, and temperature characteristics of the thermal effect were obtained by use of the AGA-780 thermovisor connected to a computer system Possible mechanisms of the interrelationship between the visual stimuli and the thermal reaction of the human brain are discussed I S

A86-10696
NEURONAL REACTIONS AND EVOKED POTENTIALS IN THE SUBCORTICAL BRAIN STRUCTURES IN THE PROCESS OF VISUAL RECOGNITION. I FORMULATION OF THE PROBLEM AND BASIC METHODS FOR ITS SOLUTION [REAKTSII NEIRONOV I VYZVANNYE POTENTSIALY V PODKORKOVYKH STRUKTURAKH MOZGA PRI ZRITEL'NOM OPOZNANII. I - POSTANOVKA ZADACHI I OSNOVNYE METODY EE RESHENIIA]
IU D KROPOTOV and V A PONOMAREV (AMN SSSR, Institut Eksperimental'noi Meditsiny, Leningrad, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 11, July-Aug 1985, p 563-575 In Russian refs

The problems of studying the neurophysiological processes taking place during visual perception are discussed, including the methods used and the results obtained The effects of visual stimuli on neuronal impulses and evoked potentials were registered in patients during functional diagnoses with the use of implanted electrodes It was demonstrated that the processes of visual perception induce neuronal activity in the nuclei of the thalamus and striopallidal system The nature of these reactions depends on the type of activity initiated by the visual stimuli. A system of psychological tests is proposed for the analysis of characteristic responses in the human brain to somatosensory features of visual stimuli I S.

A86-10697
PRESTIMULUS EEG AND EVOKED POTENTIALS IN MAN DURING THE RECOGNITION OF A MEANINGFUL LIGHT STIMULUS [PREDSTIMUL'NYE EEG I VYZVANNYE POTENTSIALY CHELOVEKA PRI OPOZNANII ZNACHIMOGO SVETOVOGO STIMULA]
L A POTULOVA and IA A. VASILEV (AN SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neirofiziologii, Moscow, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 11, July-Aug 1985, p 580-585 In Russian refs

EEG spectra for the motor and vision areas of the neocortex were recorded before and during exposure to digital light stimuli in order to determine what changes in the spectral correlation parameters of the prestimulus EEG and what components of the evoked potential (EP) accompany recognition of the light stimulus It was found that correct recognition is manifested in an increase in the amplitude and a shortening of the latent period of the late component N 140 of the EP A decrease in the relative number of slow waves and an increase in the number of fast waves in the background potential of the neocortex were recorded A decrease in the correlation coefficient (cc) in the left hemisphere corresponded to an increase in the cc in the right hemisphere I S

A86-10698
CHARACTERISTICS OF EXTERNAL RESPIRATION IN INHABITANTS OF THE NORTHEASTERN USSR [OSOBENNOSTI VNESHNEGO DYKHANIIA U ZHITELEI SEVERO-VOSTOKA SSSR]
L N MATVEEV, A G MARACHEV, A N KOZIN, S A KHARKOV, and I Z SHERES (AMN SSSR, Institut Morfologii Cheloveva, Moskovskii Medizinskii Stomatologicheskii Institut, Moscow, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 11, July-Aug 1985, p 634-640 In Russian refs

The respiratory volume and rate parameters measured in 246 short-term and long-term residents of the northeastern USSR were compared to the corresponding features of 90 Moscow residents to determine the effects of residence in the far north on the respiratory system A positive decline in the average values of respiratory rate parameters was found in the inhabitants of the northeast, compared to the Moscow inhabitants, leading to a decrease in the maximal efficiency in the gas exchange and to the reduction of the breathing reserve by one third Subjects who lived in the northeast for more than 10 years exhibited alterations in functional parameters that indicate changes in lung parenchyma, resulting in a considerable decrease in breathing reserve I S.

A86-10699
INDICATORS OF EXTERNAL RESPIRATION IN YOUNG ATHLETES DURING ADAPTATION TO HIGH ENVIRONMENTAL TEMPERATURE [POKAZATELI VNESHNEGO DYKHANIIA U IUNYKH SPORTSMENOV PRI ADAPTATSII K VYSOKOI TEMPERATURE SREDY]
K N KACHANOVSKII (Turkmenskii Gosudarstvennyi Pedagogicheskii Institut, Chardzhou, Turkmen SSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 11, July-Aug 1985, p 641-644 In Russian refs

A86-10700
THE EFFECT OF 24-HR SLEEP DEPRIVATION ON THE METABOLISM OF BIOGENIC AMINES [VLIIANIE 24-CHASOVOI DEPRIVATSII SNA NA OBMEN BIOGENNYKH AMINOV]
T D BOLSHSKOVA, S A MESHCHERIAKOVA, V F TIABENKOVA, N I ROMANOVA, IA I LEVIN (I Moskovskii Meditsinskii Institut, Moscow, USSR) et al Fiziologiia Cheloveka (ISSN 0131-1646), vol 11, July-Aug 1985, p 652-656 In Russian refs

Concentrations of catecholamines, serotonin, histamine, and their metabolites before, during, and after 24-hr sleep deprivation (SD), and after a night of restorative sleep were measured in the blood and urine of 10 healthy men The excretion of all amines rose above the control levels after the sleepless night, indicating increased secretory activity in the system of biogenic amines Chemical changes accompanied the increased levels of behavioral activity reported earlier (Vein et al., 1982; Levin, 1983) Most of the changes disappeared after the restoration period, except those of the metabolic indicators of serotonin and tryptophan, which showed lingering reductions in blood activities It is suggested that this residual lingering effect of SD might be at the base of biological changes caused by frequently repeated periods of SD, which may lead to permanent pathological conditions I S

A86-10701
ADAPTATION OF THE HUMAN ORGANISM TO THE REPEATED SHORT-TERM EXPOSURES TO A HOT ENVIRONMENT [ADAPTATSIIA ORGANIZMA CHELOVEKA K POVTORNYM KRATKOVREMENNYM VOZDEISTVIIAM ZHARKOI SREDY]
A T MARIANOVICH, V D BAKHAREV, V S BALANDIN, and V G NIKIFOROV (Voenno-Meditsinskaia Akademiia, Leningrad, USSR) Fiziologiia Cheloveka (ISSN 0131-1646), vol 11, July-Aug 1985, p 684-686 In Russian refs

Eight healthy subjects were exposed for 2 hr to 49 C ecactly 1 yr after five such 2-hr exposures, and their heat tolerance (HT) was compared to that found in the experiment of the previous year (Bakharev et al , 1983) HT was measured according to the criteria of rectal temperature, perspiration and heart rate, and according to the subjective evaluation of health and work efficiency While the physiological effects of heat exposure did not change after a one-year period, the psychological indices pointed to better tolerance to the latest heat exposure than was found in the experiments of the previous year It is suggested that the reason for this psychological adaptation might be the recognition by the subjects of the transient nature of the effects of short-term heat exposures experienced during the previous experiment I S

A86-10750
A STUDY OF FUNCTIONAL ASYMMETRY OF PAIRED ORGANS IN AIRCRAFT PERSONNEL [ISSLEDOVANIE FUNKTSIONAL'NOI ASIMMETRII PARNYKH ORGANOV U LITS LETNOGO SOSTAVA]
V A BODROV and A G FEDORUK Voenno-Meditsinskii Zhurnal (ISSN 0026-9050), July 1985, p 50-52 In Russian refs

Motor and sensory indicators of functional asymmetry were analyzed in flying and ground-based aircraft personnel for the purpose of determining the importance of these criteria in the selection of future aviators While most subjects in all groups exhibited right-side (R) vision, hearing, and hand dominance, the flying personnel showed a higher number of the R dominance in hearing Comparison of trainees and differently qualified pilots has shown the highest incidence of R dominance in hearing, vision, and hand functions in pilots of the first class When pilots were divided into a relatively infrequently erring (IE) and often-erring (OE) groups, the former pilots exhibited a higher incidence of R dominance of hand, vision, and hearing, while the pilots in the OE group had relatively higher incidence of left-side dominance, indicating the importance of these tests in selection of trainees I S

A86-11750
A DIFFERENTIAL EVALUATION OF THE MECHANISM OF THE EFFECT OF NOISE ON THE EAR IN RELATION TO NOISE FREQUENCY CHARACTERISTICS (CLINICAL AND EXPERIMENTAL STUDY) [DIFFERENTSIROVANNYI PODKHOD K OTSENKE MEKHANIZMA DEISTVIIA SHUMA NA ORGAN SLUKHA V ZAVISIMOSTI OT EGO CHASTOTNYKH KHARAKTERISTIK /KLINIKO-EKSPERIEMNTAL'NOE ISSLEDOVANIE/]
B V SHISHOV (Leningadskii Sanitarno-Gigienicheskii Meditsinskii Institut, Leningrad, USSR) Vestnik Otorinolaringologii (ISSN 0042-4668), Sept -Oct 1985, p 13-15 In Russian refs

Experiments conducted on guinea pigs and factory workers to determine the effect of various noise frequencies on the ear are presented The experimental conditions and procedures used on 102 six-eight-months-old guinea pigs are described The animals were subjected to noise of 2000, 400, and 8000 Hz at 80-100 dB for four to six hours, the observed effects on the cochlea and on the nucleic acids are explained A clinical test on 92 workers of a porcelain factory and 83 workers of a textile factory is described, the workers were exposed to the same frequencies and decibels as the guinea pigs The effect of noise on auditory functions is examined The correlation between the experimental and clinical data is explained The results reveal that an increase in noise frequency causes a narrowing in the extent of changes toward the base of the cochlea, and that an increase in noise frequency by an octave causes a decrease in noise intensity by 5 dB I F

A86-11833* National Aeronautics and Space Administration, Washington, D C
THE SKELETON IN SPACE
A W GOODE (London Hospital, England) and P C RAMBAUT (NASA, Washington, DC) Nature (ISSN 0028-0836), vol 317, Sept 19, 1985, p 204, 205 refs

Calcium loss experience by astronauts under weightless conditions is discussed I-125 photon absorption measurements on astronauts on the Apollo 14, 15, and 16 flights showed bone density decreases of 6 6 percent in one astronaut and 7 3 percent in another The estimated total body calcium loss on Apollo 17 was 0 2 percent The test results indicate that calcium losses occur mainly from the weight-bearing parts of the skeleton Measures to counteract the losses include 'penguin' suits, maintenance of nutrient intakes at high levels, and extensive exercise on ergometer and treadmill C D

A86-12362#
PRELIMINARY MEDICAL RESULTS OF THE 5-MONTH FLIGHT ONBOARD SALYUT-7-SOYUZ-T
E I VOROBEV, O G GAZENKO, E B SHULZHENKO, A I GRIGOREV, A S BARER et al IN International developments in space stations and space technologies, Proceedings of the Thirty-fifth Congress, Lausanne, Switzerland, October 7-13, 1984 New York, AIAA, 1985, p 209-215
(IAF PAPER 84-184)

Two Soviet astronauts performed a long-term space flight during the time from June 27 to November 23, 1983 Medical investigations regarding the two men were performed during and after the flight The investigations had the objective to acquire more data about the reaction of the human body to a prolonged exposure to weightlessness The present paper is concerned with the preliminary results of the medical studies Attention is given to the general characterization of the 150-day flight, a general characterization of the status of the crew, measurements conducted during lower body negative pressure tests, measurements made during exercise tests, the physiological and hygienic aspects of astronauts during extravehicular activity, biochemical examinations, and postflight examinations The obtained data have demonstrated once again that man can efficiently and productively work in long-term space flights G R

A86-12363#
PERIODISATION AND CLASSIFICATION OF ADAPTIVE REACTIONS OF MAN IN PROLONGED SPACE FLIGHTS
O G GAZENKO, E B SHULZHENKO, A I GRIGOREV, and A D EGOROV IN International developments in space stations and space technologies, Proceedings of the Thirty-fifth Congress, Lausanne, Switzerland, October 7-13, 1984 New York, AIAA, 1985, p 216-225 refs
(IAF PAPER 84-185)

With respect to physiological changes, weightlessness appears to be the most important of various factors to which the human body is subjected during a space flight The changes produced in the vital functions of the body during an exposure to weightlessness are considered, taking into account adaptive reactions and the time of their occurrence It is found that the phase of completion of primary adaptive reactions (4-6 weeks in duration), is characterized by the further development of adaptive reactions and the recovery (partial or complete) of the final adaptive effects of certain functions The period of relative stabilization of adaptation reactions represents the attainment of a new level with respect to the functioning of basic systems of the body G R

A86-12376
AGE-RELATED AUGMENTATION OF PLASMA CATECHOLAMINES DURING DYNAMIC EXERCISE IN HEALTHY MALES
J L FLEG, S P TZANKOFF, and E G LAKATTA (NIH, Gerontology Research Center, Baltimore, MD) Journal of Applied Physiology (ISSN 0161-7567), vol 59, Oct 1985, p 1033-1039 refs

A86-12377
EFFECT OF HEAD-DOWN TILT ON BASAL PLASMA NOREPINEPHRINE AND RENIN ACTIVITY IN HUMANS
S R GOLDSMITH, G. S FRANCIS, and J N COHN (Hennepin County Medical Center, U S Veterans Administration Medical Center, Minnesota, University, Minneapolis) Journal of Applied Physiology (ISSN 0161-7567), vol 59, Oct 1985, p 1068-1071 USVA-supported research refs
(Contract NIH-HL-22977-03)

The effects of loading cardiopulmonary baroreceptors on basal norepinephrine and renin activity were studied in six normal human subjects Loading of cardiopulmonary baroreceptors was accomplished by a 60-min 30-deg head-down tilt with small supplemental saline infusions Central venous pressure was measured continuously by intrathoracic catheter, arterial pressure was measured indirectly by cuff During the tilt, central venous pressure increased from 5 1 + or - 1 3 to 8 9 + or - 1 7 mmHg (P less than 0 001), whereas arterial pressure was unchanged Plasma norepinephrine (185 + or - 85 pg/ml) and plasma renin activity (3 9 + or - 5 7 ng/ml h) did not change Moderate sustained loading of cardiopulmonary baroreceptors is therefore without effect on unstressed plasma norepinephrine and renin activity in normal humans, suggesting that the tonic inhibitory effects of these receptors on these neurohumoral control systems are not readily increased in the basal state Author

A86-12426#
MEDICAL REQUIREMENT FOR MANNED SPACE PROGRAMME
P C CHATTERJEE (Indian Air Force, New Delhi, India) Aviation Medicine, vol 28, Dec 1984, p 102-106

Medical requirements for manned space programs basically include freedom from clinical or subclinical diseases and absence of definite predisposition The capability to withstand different stresses encountered during a spaceflight as produced by different simulators is also required The system of selecting cosmonauts is being constantly improved, taking into account past experience, flight peculiarities, mission duration, and scientific tasks to be performed Advancement in general medicine, biomedical engineering, space medicine, and medical experimentation, both inflight and postflight, constantly updates the system Author

A86-12427#
MEDICAL EVALUATION OF COSMONAUTS - PHYSIOLOGICAL STRESS TESTING
M B DIKSHIT, P K BANERJEE, J S KULKARNI, E M IYER (Indian Air Force, Institute of Aviation Medicine, Bangalore, India), and M M SINGH (Air Force Central Medical Establishment, New Delhi, India) Aviation Medicine, vol 28, Dec 1984, p 107-115 refs

The physiological stress testing of cosmonauts is examined The means of assessing the ability of an individual to withstand zero gravity and recover, and the effects of zero gravity on the cardiovascular and renal systems are discussed The testing of lung capacity using a spirometry is explained The use of bicycle ergometry tests to evaluate physical fitness by monitoring heart rate, blood pressure, and ventilation is explained Orthostatic tolerance was measured using tilt table tests and cardiovascular reflex responses were determined by cold pressure tests, these tests are described and the results are tabularly presented The possible disadvantage of high endurance physical capacity during space flights is explained The addition of heat balance studies to the evaluation of cosmonauts is discussed I F.

A86-12428#
MEDICAL EVALUATION OF COSMONAUTS - CARDIOVASCULAR ASSESSMENT
V M ALURKAR (Indian Air Force, Command Hospital, Bangalore, India) Aviation Medicine, vol 28, Dec 1984, p. 116-120

A high level of functional efficiency of the cardiovascular system is essential for space flight The considerable increase in G force during launch, weightlessness during orbital flight, and physiological readjustments during reentry are the main stresses affecting the cardiovascular system Hence special emphasis is laid on ruling out any underlying heart disease by a thorough clinical, biochemical, radiological, and electrocardiographic examination ECG at rest and on stress testing are especially useful Echocardiographic examination has been extremely useful in the diagnosis of IHSS, MVP, and bicuspid aortic valve which could have been undetected earlier Author

A86-12429#
MEDICAL EVALUATION OF COSMONAUTS - ASSESSMENT OF VESTIBULAR SYSTEM
S P DESHMUKH (Indian Air Force, Institute of Aviation Medicine, Bangalore, India) Aviation Medicine, vol 28, Dec 1984, p 121-127 refs

The testing of cosmonauts to evaluate their vestibular system is examined The four tests, functional, provocative, adaptive capacity, and simulation, used to evaluate vestibular performance are described The testing of the candidates included an otolithic reaction test, Khilov's swing test, continuous cumulative coriolis acceleration, and discontinuous cumulative coriolis acceleration The apparatuses, test procedures, and results are explained The chart used to grade the vestibular reaction of the cosmonauts to the tests is provided Additional basic vestibulometric tests performed are listed I F

A86-12430#
MEDICAL EVALUATION OF COSMONAUTS - 'ACCELERATION'
K RAI and M N GUPTA Aviation Medicine, vol 28, Dec 1984, p 128-132

Large acceleration stresses are encountered by cosmonauts at different phases of space flight Their magnitudes and durations are discussed highlighting certain physiological effects to determine tolerance limits During launch and re-entry the choice of supine G has been explained The acceleration test profiles used at IAM for cosmonaut evaluation with results of 9 subjects have been presented Author

A86-12432#
DENTAL EVALUATION OF COSMONAUTS
Y P KAPOOR (Indian Air Force, Dental Centre, Bangalore, India) Aviation Medicine, vol 28, Dec 1984, p 140-144 refs

The stomatoscopy, electro-odonto-diagnostics and thermal test, and stomatological investigation used in the dental evaluation of cosmonauts are described The procedures involved in the clinical examination of the oral cavity are discussed Explanations of the problems with individual teeth, which include dental caries, attrition, abrasion, tooth mobility, migration of teeth, overbite, open bite, and cross bite are provided The examination of the alveolar mucosa and gingiva is described The periodontium is observed for periodontal pockets and the temporomandibular joint is examined for any irregularities The second step in the dental evaluation includes electro-odonto-diagnostics and a thermal test The use of the electric pulp tester, which indicates the vitality or nonvitality of the pulp, combined with the thermal test is examined Possible dentofacial abnormalities are observed with an orthopantograph of the skull The dental standards for successful completion of the examination are discussed I F

A86-12433#
MEDICAL EVALUATION OF COSMONAUTS - BIOCHEMICAL INVESTIGATIONS
S K ADAVAL (Indian Air Force, Command Hospital, Bangalore, India) Aviation Medicine, vol 28, Dec 1984, p 145-150 refs

The use of biochemical tests to evaluate the fitness of a cosmonaut and to discover any latent pathology is described The three stages of biochemical testing which include the initial assessment of fitness, the hospital evaluation, and the final examination are explained The biochemical tests conducted are presented, emphasis is placed on cardiovascular fitness and blood lipids The hematological changes, which include loss of red blood cells, that occur during space flight are described and explanations for these effects are proposed The loss of bone and muscular

substance and muscular atrophy due to calcium loss and a negative balance of potassium and nitrogen are explained The effect of space flight on the metabolic process is examined The study of interferon and human lymphocytes in order to improve an individual's immunological protection is discussed I F

A86-12434#
EEG STUDIES IN EPISODIC UNCONSCIOUSNESS, SEIZURE DISORDER AND SYNCOPE
K R BANERJEE (Indian Air Force, Command Hospital, Bangalore, India), J S KULKARNI (Air India, Bombay, India), and J M WADHAWAN (Indian Air Force, Institute of Aviation Medicine, Bangalore, India) Aviation Medicine, vol 28, Dec 1984, p 151-157 refs

The study of clinical epilepsy and syncope in 524 subjects, in order to compare the usefulness of a clinical diagnosis and an EEG diagnosis and to determine the effect of routine provocative techniques, is discussed The EEG recording procedure and the use of hyperventilation and photic simulation are described The evaluation criteria which is divided into normal, borderline, and abnormality are explained The results which reveal distributions as per age, sex, history, with and without hyperventilation and photic stimulation, and of the morphology and type of electrical discharge of abnormal EEG are tabularly presented The results, which correlate well with previous studies, are explained and the importance of family history in interpreting an EEG is discussed The results indicated that a clinical diagnosis is more useful than EEG diagnosis in determining epilepsy and syncope I F

A86-12435#
AIRSICKNESS AMONG INDIAN AIRLINES PASSENGERS
K S VERMA (Indian Airlines, New Delhi, India) Aviation Medicine, vol 28, Dec 1984, p 158-161 refs

N86-10739# Joint Publications Research Service, Arlington, Va
HEMODYNAMICS DURING GRAVITATIONAL OVERLOADS (MATHEMATICAL MODELING) Abstract Only
B L PALETS, A A POPOV, M A TIKHONOV, and D Y ARKHANGELSKIY . *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 1 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 2, Mar - Apr 1985 p 185-191 Original language document announced in IAA as A85-33952
Avail NTIS HC A06

A mathematical model is developed for the regulation of human blood circulation under +Gz acceleration in the head-pelvis direction A digital-computer study of the model shows that it is adequate to experimental data with respect to indices of systemic hemodynamics in the entire +Gz acceleration range up to the tolerance limit Regulatory processes determining changes in the central blood volume are shown to play an important role in the pattern of circulation response to +Gz acceleration, the role of active venomotor responses is relatively small B J (IAA)

N86-10740# Joint Publications Research Service, Arlington, Va
STUDY OF HYPOKINESIA AND ACCELERATION EFFECTS ON HUMAN CHROMOSOMES Abstract Only
N N BOBKOVA *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 1 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 2, Mar - Apr 1985 p 300-302
Avail NTIS HC A06

A thirty-day antiorthostatic hypokinesia with an -8 deg angle to horizontal position followed by laterally-directed 8 g accelerations for 40 s did not lead to any chromosomal damage in peripheral blood lymphocytes of adult subjects with arthereosclerosis and vegetative vascular dystonia E A K

N86-10743# Joint Publications Research Service, Arlington, Va
DYNAMICS OF CHANGES OF STATISTICAL INDICATORS OF HEART RHYTHM OF PERSONS WITH DIFFERENT DEGREE OF MOTION SICKNESS Abstract Only
S S MARKARYAN, A V IGREVSKIY, and Y A KOROTKOV *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 46 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 1, Jan - Feb 1985 p 157-158
Avail NTIS HC A06

The possibility of using variation pulsometry to reveal latent forms of motion sickness, in seamen who participate in long voyages was studied It was shown that this procedure could detect latent motion sickness in seamen It is found that there are definite differences of adaptation to motion sickness in persons with different levels of resistance of Coriolis acceleration Subjects resistant to vestibular effects revealed only a slight tendency toward insignificant changes of heart rhythm E A K

N86-10744# Joint Publications Research Service, Arlington, Va
EFFECT OF SINGLE ACTIONS OF WEAK ELECTROMAGNETIC FIELDS OF ULTRALOW FREQUENCY ON INDICES OF ENDOCRINE SYSTEM Abstract Only
Y A ZAGORSKAYA *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 50 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 2, Mar - Apr 1985 p 293-299
Avail NTIS HC A06

Functions of the human endocrine system was studied after a single exposure to weak electromagnetic field of ultralow frequency with a tension close to the real geomagnetic background and one approaching the alpha rhythm of human EEG A single 5 hr exposure of healthy male subjects led to decreased activity of hypophysis-adrenal system manifested by lower levels of urinary 17-keto steroids, lower plasma cortisol and corticosterone and increased ACTH levels, accompanied by increased levels of circulating blood testosterone which in some cases exceeded the normal physiological range Increased levels of TSH and free and total thyroxin in blood was noted in some subjects The findings represent adaptable compensatory reactions of the regulatory systems showing that this system is highly sensitive to the effect of a magnetic field E A K

N86-10746# Joint Publications Research Service, Arlington, Va
ASSESSMENT OF STATE OF CHRONOTROPIC AND INOTROPIC HEART FUNCTION AT DIFFERENT DEGREES OF PHYSICAL FITNESS Abstract Only
V V AKSENOV and I G TAZETDINOV *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 62-63 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 1, Jan - Feb 1985 p 96-101 Original language document announced in IAA as A85-27781
Avail NTIS HC A06

An approach to the mathematical analysis of cardiosignals is developed which makes it possible to quantitatively evaluate the chronotropic and inotropic functios of the heart from a systems point of view Combining statistical, cross-correlation, and frequency analyses, this approach makes it possible to assess physical-training level in aerospace and sports medicine As an example, cardiosignals from the flight commanders and engineers on the Salyut-5 and Salyut-6 orbital stations were analyzed It is concluded that the mathematical analysis of cardiosignals recorded in conditions of rest makes it possible to evlauate physical-training level as the potential readiness of regulatory systems to provide for the required high level of body functioning under physical loads B J (IAA)

N86-10747# Joint Publications Research Service, Arlington, Va
CAPACITY FOR WORK AND HEMODYNAMICS IN MALES RESIDING AT MIDDLE AND HIGH LATITUDES Abstract Only
L. N MATVEYEV *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 63 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 1, Jan - Feb 1985 p 113-120
Avail NTIS HC A06

The reaction of the cardiovascular system to physical exertion of various intensity was studied Fitness for physical work of nonindigenous population of the Northeast is closely associated with length of stay in the North Performance of work analogous to that performed by men from Moscow produces a significant hyperenergic reaction of the cardovascular system Persons staying in the North for up to 5 years have adequate metabolic requirements from hyper-dynamia which provides adequate capacity for physical work and rapid recovery rates but a stay of more than 5 years gives lesser capacity for phyiscal work and slowing of recovery rates, due to an approach to the limits of adaptational capacities of the cardiovascular system Men born in the North have some limitation on their capacity for physical work but have rather rapid recovery rates, indicating a whole complex of adaptational changes E A K

N86-10748# Joint Publications Research Service, Arlington, Va
INDIVIDUAL TYPOLOGICAL FEATURES OF AUTONOMIC REACTIONS DURING AUTOGENIC TRAINING IN POLAR EXPEDITION MEMBERS IN PERIOD OF WINTERING IN ANTARCTICA Abstract Only
Y A SIDOROV *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 64 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 1, Jan - Feb 1985 p 121-128
Avail NTIS HC A06

Subjects at a coastal Antarctic station underwent autotraining sesions in individual rooms, seated in a comfortable position Autotraining sessions to achieve relaxation were most effectiv in the expedition members with average or low level of adaptive plasticity, beginning in the second half of wintering at the station Intersystem inter-relationships of central and peripheral links for providing adaptive reconstructions during autotraining of the expedition members depended on individual parameters of cerebral neurodynamics Autotraining proved to be an adequate nonmedical method for preventing and correcting disadaptational disturbances in the expedition members during their stay in Antarctica Individual differences in the plasticity of neurodynamic processes determine the nature of autonomic reactions of the body to autotraining E A K

N86-10749# Joint Publications Research Service, Arlington, Va.
EFFECT OF INCLUSION OF SUPPLEMENTARY ASCORBIC ACID IN DAILY DIET ON DEGREE OF VITAMIN SATURATION OF BODY AND THERMORESISTANCE OF ERYTHROCYTES WHILE WORKING IN ARID ZONE Abstract Only
I M MOMMADOV, V A GRAFOVA, and G A TUPIKOVA *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 64-65 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 1, Jan - Feb 1985 p 129-133 Original language document announced in IAA as A85-27786
Avail NTIS HC A06

The physiological needs for ascorbic acid and of the effect of vitamin C supplements at the rate of 150 mg/day on human resistance to heat in and zones were studied Ascorbic acid sufficiency was determined by its level in the fasting morning urine Subjects ate a dragee containing 50 mg of ascorbic acid 3 times a day immediately after meals which increased the vitamin C level in the morning urine The 150 mg/day dosage normalized the studies ascorbic acid level. The vitamin C supplement increases erythrocytes resistance to heat when working in high temperatures with high insolation E A K

N86-10750# Joint Publications Research Service, Arlington, Va
EFFECT OF VARIOUS DOSES OF SOME VITAMINS ON NON-SPECIFIC MECHANISMS OF ADAPTATION OF MAN Abstract Only
V S NOVIKOV and V N BORTNOVSKIY *In its* USSR Rept Life Sci Biomed and Behavioral Sci. (JPRS-UBB-85-023) p 65 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 1, Jan - Feb 1985 p 134-137 Original language document announced in IAA as A85-27787
Avail NTIS HC A06

An experimental study was conducted to investigate the effect of vitamin additions on the state of the vascular system in the nonspecific resistance of the body in persons working in unfavorable environmental conditions Thirty operators 19 to 23 years of age were studied whose work was characterized by high work strain, hypokinesia, and environmental discomfort (e g , high air temperature) One group of 10 subjects received the following vitamins daily retinol acetate (0 00172 g), thiamine bromide (0 0026 g), riboflavin (0 002 g), nicotinamide (015 g) pyridoxin hydrochloride (0 002 g), and ascorbic acid (0 07 g) A second group of 10 subjects received a double dose of the same vitamins, while a third group (the control) received placebos Administration of the vitamins in a double dose was found to prevent the development of deadaptive changes It is concluded that vitamin additions can prevent a reduction in the nonspecific resistance of the body under extreme environmental conditions E A K

N86-10751# Joint Publications Research Service, Arlington, Va
ADAPTATION OF MAN TO EXTREME CONDITIONS OF ANTARCTICA Abstract Only
S I SOROKO, A L MATUSOV, and Y A SIDOROV *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 66 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 10, no 6, Nov - Dec 1984 p 907-920
Avail NTIS HC A06

An effort is made to clarify the problem of human adaptation to Antarctic conditions on the basic of multiyear complex ecological-physiological studies These studies include the investigation of (1) the ecological factors (natural and anthropogenic) of Antarctica, (2) individual features of the adaptive plasticity of central and vegetative mechanisms of regulation under various factors of the winter stay, (3) the dynamics of analyzer systems, (4) the work capacity of polar workers, (5) the psychoneural status of workers, and (6) the health of expedition members It is concluded that the complex of extreme factors of Antarctica makes severe demands on the nervous, vegetative, and psychoemotional elements of human beings, calling forth all the reserve capacities of the body B J (IAA)

N86-10752# Joint Publications Research Service, Arlington, Va
INDIVIDUAL TYPOLOGICAL SELF-REGULATION OF CARDIO-VASCULAR SYSTEM Abstract Only
Y G VASHCHILLO, M A KONSTANTINOV, and D N MENITSKIY *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 67 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 10, no 6, Nov - Dec 1984 p 929-936 Original language document announced in IAA as A85-19936
Avail NTIS HC A06

New data are reported pertaining to individual expological differences in the guided self-regulation of heart rate (HR) and artenal pressure (AP) in a visual feedback tracking study Particular attention is given to individual differences in the latency of effects from baroreceptors at different levels of CNS regulation, these differences being manifested in differences in the amplitude-phase characteristics of guided oscillations of HR and AP rhythms with respect to a sinusoidal control signal It is concluded that the proposed technique can be used as a training tool in alternating-load exercise and to study the possibility of destabilizing a regulation system with the aim of changing its state Author

N86-10753# Joint Publications Research Service, Arlington, Va
CONDITIONING POTENTIALITIES OF RESPIRATORY APPARATUS Abstract Only
F T AGARKOV *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 69 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 10, no 6, Nov - Dec 1984 p 981-987
Avail NTIS HC A06

The temperature of expired alveolar air sublingual, axillary and rectal temperature with temperature of the environment at -30 up to +30 C +50, +60 and +70 C in a heat chamber Temperature of expired alveolar air at the height of maximally deep exhalation has the same value Heat or cold, disturbing the isothermy, caused destabilization and an increasing change of the temperature of exhaled alveolar air Exogenous heat effects disturb isothermy of the organism and destabilize the temperature of the alveolar air Factors which limit the conditionaing potentials of the respiratory apparatus in the presence of intense heat include the air temperature, the air humidity and developing hypothermia, the degree of pronouncement of which determines the degree of increase of temperature of the alveolar air, to the greatest extent It is assumed that the respiratory apparatus is not an ideal conditioner and the existing idea about the constancy and the conformity of the temperature of the alveolar air to the temperature of the core of the body is reconsidered E A K

N86-10755# Joint Publications Research Service, Arlington, Va
CLASSIFICATION OF CHANGES IN ELECTROCARDIOGRAM DURING MUSCULAR EXERTION OF HEALTHY INDIVIDUALS Abstract Only
A I ZAVYALOV *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 73 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 2, Mar - Apr 1985 p 201-207
Avail NTIS HC A06

The determination of human endurance during physical stress is one of the most important tasks in aviation, space, work and in sport physiology Bodily fuctioning depends on the cardio-respiratory system and evaluation of the myocardium during exertion is achieved by study of the electric activity of the heart The dynamics of EKG were studied on subjects while applying various stress loads Advanced athletes and sedentary individuals were examined during exercise and in rest periods Telemetric and conductive EKG seismography, photoplethysmography and arterial pressure were studied The data statistically leading to comparative analysis was analyzed Appearance of overstress signals on EKG was accompanied by decreased frequency of heart contractions, a drop in systolic arterial pressure, lowered blood supply, decreased amplitude of seismocardiac signals and of the photoplethysmography wave, indicating a disorder in the contractural function of the myocardium E A K

N86-10756# Joint Publications Research Service, Arlington, Va
EYE-MOVEMENT ACTIVITY AS INDEX OF FUNCTIONAL STATE OF BRAIN Abstract Only
Y D KHOMSKAYA and I V YEFIMOVA *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 73 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 2, Mar - Apr 1985 p 235-240
Avail NTIS HC A06

Two types of eye movements slow or tracing movements and fast, saccadic movements with different control mechanisms were studied Rhythmic saccadic eye movements were studied in relationship to mental fatigue which develops during the day and the characteristics of eye movements in individuals with varying degree of motor activity A definite correlation between the parameters of eye movement reactions and general motor activity of the subjects with their functional state was found Fatigue and emotional stress resulted in increased frequency of eye movements especially in the more sedentary individuals It is suggested that eye movement reactions could be used as diagnostic tools in determining the functioning state of the brain E A K

N86-10757# Joint Publications Research Service, Arlington, Va
MECHANISM OF ADAPTOGENIC ACTION OF PRICKLY ELEUTEROCOCCUS ON MAN DURING HEAT STRESS Abstract Only
G N NOVOZHILOV and K K SILCHENKO *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 74 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 2, Mar - Apr 1985 p 303-306 Original language document announced in IAA as A85-33964
Avail NTIS HC A06

The application of eleutherococcus extract in the course of 10 days prior to applied heat stress was found to have a favorable effect on body thermoregulation, body temperature was 0 73 C lower in test subjects than in the control group However, a high biological cost for the heat adaptation was observed, expressed in two effects (1) a significantly higher energy cost of enhanced thermal stability under eleutherococcus administration than in the control group, and (2) a more pronounced mobilization of proteins, manifested in the growth of the fraction of protein consumed in the energy metabolism and in a higher level of excretion of nitrogen compounds in the sweat and urine Author

N86-10758# Joint Publications Research Service, Arlington, Va
VESTIBULAR RESISTANCE AND BLOOD CIRCULATION CHANGES IN ORTHOSTATIC POSITION DURING HYPERTHERMIA Abstract Only
V I SOBOLEVSKIY *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 74-75 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 2, Mar - Apr 1985 p 327-330
Avail NTIS HC A06

Vestibular and orthostatic stability of the body under various environmental conditions in applied human physiology especially under conditions of progressive exogenic hyperthermia was studied Thermogenic changes of arterial pressure, volume of circulating blood and peripheral resistance were studied in gravitational and vestibular loads It was shown that with limited internal hyperthermia the vestibular and orthostatic stabilities of men are unaffected The principal mechanism of lowering resistance to vestibular and gravitational irritants is the disturbance in the blood circulating system and in cardiac activity E A K

N86-10759# Joint Publications Research Service, Arlington, Va
HEAT TRANSFER MECHANISM IN HUMAN EXTREMITIES Abstract Only
T G RAYGORODSKAYA, V N KOSHELEV, and O L PERTSOV *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 75 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 2, Mar - Apr 1985 p 336-338
Avail NTIS HC A06

The possible effects of conductive and convective forms of heat transfer on the formation of the skin temperature field in the lower extremities during exercise of the muscles are assessed by a comparison of experimental data with numerical results obtained on the basis of the mathematical model of Koshelev and Pertsov (1978) Results indicate that the role of heat conduction in the transfer of heat from deep muscles to extremity surfaces is insignificant, while most of the hat dissipation in the tissues and heat transfer to the surfaces occurs convectively B J (IAA)

N86-10765# Joint Publications Research Service, Arlington, Va
TV MONITORING CONTROL SYSTEM IN ELECTROPHYSIOLOGICAL STUDIES Abstract Only
Y G KRATIN, Y P POPECHITELEV, A N SOLOVYEV, and Y I BUCH *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 78 18 Sep 1985 Transl into ENGLISH from Fiziol Zh SSSR Im I M Sechenov (Leningrad), v 71, no 3, Mar 1985 p 381-383
Avail NTIS HC A06

In electrophysiological experiments and during determination of EEG curves, the flow of formation must be filtered to isolate most important indices to be able to follow the functional state of

the brain A special monitor was constructed which consists of a TV camera, video-control unit and an image synthesizer consisting of synchronous impulse selector, round figure contructor and a coloring block The degree of brain activity is converted to the background color scheme, to study the subject concurrently with the observation of brain activation This apparatus can be modified for other clinical applications E A K

N86-10768* National Aeronautics and Space Administration, Washington, D C
AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 275)
Sep 1985 99 p
(NASA-SP-7011(275), NAS 1 21 7011(275)) Avail NTIS HC $7 00 (special price) CSCL 06E

This bibliography lists 321 reports, articles, and other documents introduced into the NASA scientific and technical information system in August 1985 E A K

N86-10769 Maryland Univ , College Park
DETERMINATION OF SYMMETRY AND PHASE IN HUMAN VISUAL RESPONSE FUNCTIONS: THEORY AND EXPERIMENTS Ph.D. Thesis
D G STORK 1984 189 p
Avail Univ Microfilms Order DA8510459

Several mathematical and experimental techniques to deduce the temporal impulse response and static line spread function of the human visual system were employed The problem of linearity in the visual system near threshold is recieved and the mathematical foundations of different experimental approaches are discussed It is found that the method of constant (threshold) output avoids certain difficulties associated with other methods The use of harmonic stimuli in vision, and the inherent phase or symmetry ambiguities associated with it are described Physiological data on cat responses are analyzed It is demonstrated that a spatially antisymmetric line spread function explains this data better that a spatially symmetric one A novel stimulus segconverging and diverging stimuli is introduced and show how it can be used to probe spatial symmetry of the line spread function It is demonstrated that the sensitivity to converging and diverging stimuli are equal It is shown that adaptation to velocity stimuli at one retinal position can affect (reduce) sensitivity at spatially separated positions Dissert Abstr

N86-10770*# Pennsylvania Univ , Philadelphia Dept of Computer and Information Service
STRENGTH MODELING REPORT
N I BADLER, P LEE, and S WONG 30 May 1985 79 p refs
(Contract NAS9-16634)
(NASA-CR-171896, NAS 1 26 171896) Avail NTIS HC A05/MF A01 CSCL 06P

Strength modeling is a complex and multi-dimensional issue There are numerous parameters to the problem of characterizing human strength, most notably (1) position and orientation of body joints, (2) isometric versus dynamic strength, (3) effector force versus joint torque, (4) instantaneous versus steady force, (5) active force versus reactive force, (6) presence or absence of gravity, (7) body somatotype and composition, (8) body (segment) masses, (9) muscle group envolvement; (10) muscle size, (11) fatigue, and (12) practice (training) or familiarity In surveying the available literature on strength measurement and modeling an attempt was made to examine as many of these parameters as possible The conclusions reached at this point toward the feasibility of implementing computationally reasonable human strength models The assessment of accuracy of any model against a specific individual, however, will probably not be possible on any realistic scale Taken statistically, strength modeling may be an effective tool for general questions of task feasibility and strength requirements G.L.C

N86-10771# Federal Aviation Administration, Washington, D C Office of Aviation Medicine
THE EFFECTS OF AGE, SLEEP DEPRIVATION, AND ALTITUDE ON COMPLEX PERFORMANCE
H W MERTENS and W E COLLINS May 1985 22 p
(AD-A156987, AD-E950724, FAA-AM-85-3) Avail NTIS HC A02/MF A01 CSCL 06S

Little research has been concerned with the combined effects on performance of age, sleep deprivation, and altitude This study examined their potential interaction with laboratory tasks measuring aviation-related psychological functions Healthy men in two age groups, 30-39 yr (N=16) and 60-69 yr (N=14), were evaluated for complex (time-shared) performance in the four possible combinations of two altitudes (ground level vs 3,810 m (12,500 ft)) and two sleep conditions (sleep permitted vs sleep deprived) Following training, performance was evaluated during 3-h test sessions in the morning and afternoon of each of 4 test days Complex performance, measured by the Multiple Task Performance Battery (MTPB), included monitoring of warning lights and meters, mental arithmetic, problem solving, target identification, and tracking Workload was varied within each hour by varying the tasks performed simultaneously Performance was significantly lower in the older subjects, but age did not interact significantly with sleep deprivation or altitude When subjects were rested, altitude had no effect When subjects were sleep deprived, performance was significantly lower in general, and the greatest decrement in performance occurred at altitude Increasing workload enhanced the interaction of sleep deprivation and altitude The performance of older subjects tended to be more affected by increases in workload, but decrements induced by sleep deprivation and altitude did not appear to interact with age These findings provide empirical evidence in support of warnings in the aeromedical literature concerning greater effects of sleep deprivation as altitude increases within the general aviation range GRA

N86-10772# Pacific Northwest Lab , Richland, Wash
APPROACHES TO QUANTITATIVE EXPRESSION OF DOSE RESPONSE
E S GILBERT Apr 1985 16 p refs Presented at the Symp on Epidemiol and Health Risk Assessment, Columbia, Md , 14 May 1985
(Contract DE-AC06-76RL-01830)
(DE85-013498, PNL-SA-13193, CONF-850577-1) Avail NTIS HC A02/MF A01

Quantifying risks experienced by populations been exposed to relatively low levels of harmful agents for substances are discussed DOE

N86-10773# Hauptverband der Gewerblichen Berufsgenossenschaften, e V , Bonn (West Germany)
REPORT ON THE RESEARCH ACTIVITIES ON WHOLE-BODY VIBRATIONS. HUMAN STRAIN DUE TO MECHANICAL VIBRATIONS [BEANSPRUCHUNG DES MENSCHEN DURCH MECHANISCHE SCHWINGUNGEN. KENNTNISSTAND ZUR WIRKUNG VON GANZ-KOERPER-SCHWINGUNGEN]
H DUPUIS (Mainz Univ , West Germany) and G ZERLETT (Rheinische Braunkohlenwerke AG) May 1984 148 p refs In GERMAN
(ISBN-3-88383-107-7) Avail NTIS HC A07/MF A01

Knowledge of whole-body vibration effects on man was surveyed to give authorities a guide for decision-making and judgement regarding occupational problems The acute effects of mechanical vibrations on man's organism and physiological functions are reported as well as the chronic effects of whole-body vibrations and the influence of specific strain factors Prevention measures are listed together with West German legislation and guidelines regarding the protection against mechanical vibrations at work Author (ESA)

N86-10774# Amsterdam Univ (Netherlands) Lab voor Medischefysica
VARIABILITY ANALYSIS OF VISUALLY INDUCED RESPONSES IN THE MIDST OF NOISE Ph.D. Thesis [VARIABILITEITS ANALYSE VAN VISUEEL OPGEWEKTE RESPONSIES TE MIDDEN VAN RUIS]
M F VANLOON Apr 1984 91 p refs In DUTCH
(B8564052) Avail NTIS HC A05/MF A01

The variability of EEG responses to visual stimuli, and possible relations between variations in latency and amplitude are investigated A matched filter to detect and estimate the magnitude of variabilities on series of recordings until a 20% signal to noise ratio is reached was applied to responses of two subjects Measurements show that in case of variability no relation exists between stimulus and the magnitude of the variability in latency or amplitude Variability seems mainly to depend on the condition of the subject Author (ESA)

N86-11838*# Rhode Island Univ, Kingston Dept of Physics
FIBER OPTIC PRESSURE SENSORS IN SKIN-FRICTION MEASUREMENTS Final Report
R KIDWELL Sep 1985 57 p refs
(Contract NAG1-519)
(NASA-CR-176294, NAS 1 26 176294) Avail NTIS HC A04/MF A01 CSCL 06B

Fiber optic lever pressure sensors intended for use in a low speed wind tunnel environment were designed, constructed and tested for the measurement of normal and shear displacements associated with the pressures acting on a flat aluminum plate On-site tests performed along with several static and dynamic measurements made have established that, with proper modifications and improvements, the design concepts are acceptable and can be utilized for their intended use Several elastomers were investigated for use in sensors and for their incorporation into these sensors Design and assembly techniques for probes and complete sensors were developed Author

N86-11839# American Inst of Biological Sciences, Arlington, Va
ASSESSMENTS AND VIEWPOINTS ON THE BIOLOGICAL AND HUMAN HEALTH EFFECTS OF EXTREMELY LOW FREQUENCY (ELF) ELECTROMAGNETIC FIELDS: COMPILATION OF COMMISSIONED PAPERS FOR THE ELF LITERATURE REVIEW PROJECT Final Report
May 1985 469 p
(Contract N00014-84-C-0446)
(AD-A156942) Avail NTIS HC A20/MF A01 CSCL 06R

The biological and human health effects of extremely low frequency (ELF) electromagnetic fields are discussed Among the topics discussed are The effects of ELF fields on neural development and nerve regeneration, electromagnetic fields and calcium efflux, studies of plants and animals exposed to ELF electric and magnetic fields, electromagnetic influences on birds, a review of Cell Effects Induced by Exposure of Extremely Low Frequency electromagnetic fields, the effects of ELF electric and magnetic fields on artificial cardiac pacemakers, behavioral toxicology of ELF electric and magnetic fields, electromagnetic fields and public health, influence of power frequency electric and magnetic fields on human health, ecological effects of extremely low frequency electric and magnetic fields, reproductive and developmental alterations associated with exposure of mammals to ELF (1 to 300 Hz) electromagnetic fields, behavioral effects extremely low frequency electric and magnetic fields, effects of electromagnetic fields on circadian rhythms, effects of ELF electromagnetic fields on neuroendocrine systems, immunological effects of extremely low frequency electromagnetic fields, neural effects of extremely low frequency fields as a function of induced tissue current density, magnetic and electromagnetic field effects on biological systems, and effects of extremely low frequency electric and magnetic fields on the nervous system are discussed GRA

N86-11840# Army Research Inst of Environmental Medicine, Natick, Mass
PERCEPTUAL AND PHYSIOLOGICAL RESPONSES DURING EXERCISE IN COOL AND COLD WATER
M M TONER, L L DROLET, and K B PANDOLF Jun 1985 23 p
(Contract DA PROJ 3E1-62777-A-879)
(AD-A157334, USARIEM-M-32/85) Avail NTIS HC A02/MF A01 CSCL 06S

This investigation examined the interaction of exposure to cold water stress with both perceived exertion and thermal sensation (TS) during exercise Eight male volunteers performed arm, leg and combined arm and leg exercise for 45 min in water at 20 and 26 C Exercise was performed at a low and a high intensity relative to the ergometer specific peak oxygen uptake (VO2 peak) In general, percent VO2 peak did not differ ($p > 0.05$) between types of exercise in either 20 or 26 C water During low intensity exercise when power output was matched across water temperatures (Tw), percent VO2 peak was greater ($p < 0.05$) in 20 C water (52%) compared to 26 C water (42%) Ratings of perceived exertion (RPE) did not differ ($p > 0.05$) between Tw During high intensity exercise when percent VO2 peak was matched across Tw, RPE was lower during exercise in 20 C compared to 26 C Multiple correlation analyses comparing both final RPE and thermal sensation with physiological and thermal measures were performed across type of exercise and Tw RPE was moderately correlated with heart rate and ventilation, whereas very slight relationships were established with TS, skin and rectal temperatures TS was moderately correlated with skin and rectal temperatures whereas low correlations existed between TS and both heart rate and ventilation These data suggest that the change in oxygen uptake associated with exercise in cold water does not add to the overall perception of exertion This perception appears to be related to cardiopulmonary variables rather than thermal measures, whereas thermal sensation is related to thermal measures and not cardiopulmonary variables GRA

N86-11841# Army Research Inst of Environmental Medicine, Natick, Mass
PHYSIOLOGICAL EFFECTS OF TRAINING
W J KRAEMER and W L DANIELS 25 Jun 1985 44 p
(AD-A157417, USARIEM-M-31/85) Avail NTIS HC A03/MF A01 CSCL 06P

With the evolution of exercise science a vast amount of information concerning the physiological effects of training has been generated Understanding the basic training responses and adaptations of various modes of conditioning can give the clinician insights into exercise prescription The purpose of this manuscript is not to present an exhaustive review, but provide the reader with a basic overview of the physiological effects of training Aerobic training results in a number of adaptations in humans The magnitude of this response is dependent upon a number of factors It depends upon the type, the intensity, the frequency and the duration of the training, as well as the characteristics of the person undergoing training In this section, we will discuss the physiological changes associated with the adaptation to training and how the characteristics of the individual and the training itself affect this adaptation GRA

N86-11842# Oregon Univ, Eugene Dept of Psychology
IS THE CEREBELLUM INVOLVED IN MOTOR AND PERCEPTUAL TIMING: A CASE STUDY Final Report
S W KEELE, D L MANCHESTER, and R D RAFAL 15 May 1985 21 p
(Contract N00014-83-K-0601)
(AD-A157452, TR-85-5-ONR) Avail NTIS HC A02/MF A01 CSCL 06P

A model and a technique developed by Wing and Kristofferson (1973) decomposes variance of timing into that putatively due to a central timekeeper (a clock) and that due to implementation of movement through the motor system A patient with unilateral cerebellar damage, when attempting to tap out a regular series of intervals, showed a large increase in timing variability for the left

hand compared to the right hand at target intervals of 550 msec Application of the model suggested the increased variability was in the clock. Moreover, the patient appeared to have greater than normal difficulty in discriminating the durations of auditorially based time intervals Earlier work (Wing, Keele, and Margolin, 1984) had suggested that basal ganglia damage in a Parkinson's patient also manifested itself as a clock disorder The suggestion that clock variability arises from two different sources leads us to speculate that the brain's clock involves a circuit between several brain systems These speculations are quite tentative because of interpretive problems with some of the data GRA

N86-11843# Oregon Univ , Eugene Dept. of Psychology
FORCE AND TIMING COMPONENTS OF THE MOTOR PROGRAM Final Report
R B IVRY 15 May 1985 55 p
(Contract N00014-83-K-0601)
(AD-A157584, TR-85-3-ONR) Avail NTIS HC A04/MF A01 CSCL 05J

Three experiments assess the effects of variations of force and time on response latency on both simple and choice reaction time The first two experiments demonstrate that, while latency does not vary as a function of force, increasing timing demands by requiring that a response be maintained led to increases in reaction time These results led to the development of a model of motor programming in which force and timing are dissociated as separate components. However, the data also indicated that the force component may be further analyzed into two subcomponents: force activation and force deactivation The model predicts that the latter subcomponent may be programmed on-line provided sufficient time elapses between the implementation of the two subcomponents The results of Experiment 3 support this prediction *and further validate the proposed model* GRA

N86-11844# Army Environmental Hygiene Agency, Aberdeen Proving Ground, Md
HEALTH HAZARD EVALUATION OF LIQUID MONOPROPELLANTS. PHASE 4. SUBCHRONIC INHALATION OF HYDROXYLAMMONIUM NITRATE, JANUARY 1985
19 Jul 1985 24 p
(AD-A157623, USAEHA-75-51-0132-85) Avail NTIS HC A02/MF A01 CSCL 06T

This study was conducted to determine the effects of repeated airborne exposures to animals of hydroxylammonium nitrate (HAN), a major component of liquid gun propellants This evaluation will assist in advising on the potential health risks associated with handling these materials Rats and dogs were exposed to aerosolized HAN for 90 days at concentrations of 300, 100, and 33 mg/cu m Dose-related effects occurred in both species and were characterized in rats by weight loss and spleen and liver enlargement In dogs, respiratory irritation and blood dyscrasia were the major toxic effects Minimal effects were observed at the low dose, 33 mg/cu m Personnel should be protected against all routes of HAN exposure since the systemic effects are additive An airborne concentration of HAN at 3 mg/cu m may be considered as a basis for the development of a maximum allowable workplace atmosphere Accidental exposures in man should be closely monitored for cyanosis, anemia and respiratory distress Treatment for methemoglobinemia may be indicated GRA

N86-11845# Pacific Northwest Lab , Richland, Wash
DOSE DISTRIBUTION AND THE RELATIVE BIOLOGICAL EFFECTIVENESS OF INTERNAL ALPHA EMITTERS
D. R FISHER, M E FRAZIER, and T K ANDREWS, JR Mar 1985 15 p refs Presented at the 9th Symp on Microdosimetry, Toulouse, 20 May 1985
(Contract DE-AC06-76RL-01380)
(DE85-013041, PNL-SA-12638; CONF-850506-9) Avail. NTIS HC A02/MF A01

The influence of dose distribution at the cellular level on the relative biological effectiveness of internally deposited alpha-particle emitters were examined Cultured Chinese Hamster Ovary (CHO-K1) cells were irradiated in vitro by insoluble ceramic microspheres of zirconium oxide labeled with (239)Pu The absorbed dose and dose rate were held constant at 0 7 Gy and 0 17 Gy h(-1), respectively Relative biological effectiveness (RBE) was evaluated using three endpoints initial cell survival, mutation frequency, and primary DNA damage Cell death was greatest for irradiations by sources of low specific activity Mutation frequency was greatest for cells exposed to agitated sources and least for irradiation by stationary high-specific-activity sources The amount of DNA damage increased at the alpha radiation was more uniformly distributed amongst the cells at risk DOE

N86-11846# Brookhaven National Lab , Upton, N Y
THYROID ABSORBED DOSE FOR PEOPLE AT RONGELAP, UTIRIK AND SIFO ON MARCH 1, 1954
E T LESSARD, R P MILTENBERGER, R A CONRAD, S V MUSOLINE, J R NAIDU, A MOORTHY, and C J SCHOPFER Mar 1985 84 p refs
(Contract DE-AC02-76CH-00016)
(DE85-014695, BNL-51882) Avail NTIS HC A05/MF A01

A study was undertaken to reexamine thyroid absorbed dose estimates for people accidentally exposed to fallout at Rongelap, Sifo, and Utirik Islands from the Pacific weapon test known as Operation Castle BRAVO The study included (1) reevaluation of radiochemical analysis, to relate results from pooled urine to intake, retention, and excretion functions, (2) analysis of neutron-irradiation studies of archival soil samples, to estimate areal activities of the iodine isotopes, (3) analysis of source term, weather data, and meteorological functions used in predicting atmospheric diffusion and fallout deposition, to estimate airborne concentrations of the iodine isotopes, and (4) reevaluation of radioactive fallout, which contaminated a Japanese fishing vessel in the vicinity of Rongelap Island on March 1, 1954, to determine fallout components The *conclusions of the acute exposure study were that the population* mean thyroid absorbed doses were 21 gray (2100 rad) at Rongelap, 6 7 gray (670 rad) at Sifo, and 2 8 gray (280 rad) at Utirik The overall thyroid cancer risk we estimated was in agreement with results published on the Japanese exposed at Nagasaki and Hiroshima The major route for intake of fallout was by direct ingestion of food prepared and consumed outdoors DOE

N86-11847# Lawrence Livermore National Lab , Calif
PROSPECTS FOR DNA METHODS TO MEASURE HUMAN HERITABLE MUTATION RATES
M L MENDELSOHN 14 Jun 1985 9 p Presented at the 4th Intern Conf on Environ Mutagens, Stockholm, 24 Jun 1985
(Contract W-7405-ENG-48)
(DE85-014555, UCRL-92242, CONF-8506137-5) Avail NTIS HC A02/MF A01

A workshop cosponsored by ICPEMC and the US Department of Energy was held in Alta, Utah, December 9 to 13, 1984 to examine the extent to which DNA-oriented methods might provide new approaches to the important but intractable problem of measuring mutation rates in control and exposed human populations The workshop identified and analyzed six DNA methods for detection of human heritable mutation, including several created at the meeting, and concluded that none of the methods combine sufficient feasibility and efficiency to be recommended for general application DOE

N86-11848# Maryland Univ , Baltimore
ACUTE PULMONARY EFFECTS OF FORMALDEHYDE EXPOSURE IN HUMANS Progress Report, 1 Dec. 1983 - 30 Nov. 1984
Jul 1985 6 p refs
(Contract DE-AS05-84ER-60192)
(DE85-014728, DOE/ER-60192/1) Avail NTIS HC A02/MF A01

Nonsmoking subjects were randomly exposed at rest for 3 hours each to 0 0, 0 5, 1 0, and 2 0 ppM HCHO for establishing a dose-response curve at rest, and the effect of 2 ppM HCHO with moderate exercise with a 24-hr postexposure was evaluated Results of exposure of the 10 subjects to the concentration are (1) a significant or near significant decrease, compared to clean

air, (2) the FVC and FEV1 time courses of response showed no clear change in function over any 3-hour exposure from 0 0 to 2 0 ppM HCHO, and (3) including the 2 0 ppM HCHO exposure only mild symptoms were experienced DOE

N86-11849# Oak Ridge National Lab , Tenn
IMPROVEMENT IN WEAR PERFORMANCE OF SURGICAL TI-6AL-4V ALLOY BY ION IMPLANTATION OF NITROGEN OR CARBON
J M WILLIAMS, R A BUCHANAN, and E D RIGNEY, JR Jun 1985 10 p refs Presented at the Am Soc for Met Conf on the Appl of Ion Plating and Implantation to Mater , Atlanta, 3 Jun 1985 Prepared in cooperation with Alabama Univ , Birmingham
(Contract DE-AC05-84OR-21400)
(DE85-013986, CONF-8506139-1) Avail NTIS HC A02/MF A01

The effects of ion implantations of either nitrogen or carbon on the corrosive wear performance of surgical Ti-6Al-4V alloy were investigated In vitro tests made use of an apparatus which could produce certain chemical and mechanical aspects of a sliding interface such as that which occurs between alloy and polyethylene components of an artificial hip (or knee) joint Cylindrical samples of the Ti alloy were rotated between loaded, conforming pads made of ultrahigh molecular weight polyethylene (UHMWPE) while these test components were immersed either in a saline solution or a saline solution with bovine serum added During the tests open circuit corrosion currents for the alloy were measured by the Tafel extrapolation technique Profilometry studies were done before and after the tests Alloy samples implanted with either nitrogen or carbon remained as new for all test conditions Unimplanted control samples were severely scored Corrosion currents as measured under the mechanical action were reduced by a factor of approximately one hundred by the ion implantation treatments DOE

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BEHAVIORAL SCIENCES

Includes psychological factors, individual and group behavior, crew training and evaluation, and psychiatric research

A86-10157
HUMAN PILOT PARAMETER IDENTIFICATION FOR A SIMULATED AIR-TO-GROUND TARGET ACQUISITION TASK
P A STUDER (Eidgenoessisches Militaerdepartement, Bern, Switzerland) International Journal of Modelling and Simulation (ISSN 0228-6203), vol 5, no 2, 1985, p 41-46 refs

An experimented pilot is used to perform the acquisition of a ground-fixed target during a simulated air-to-ground attack with a combat aircraft Target tracking error as well as pilot output are stored for off-line parameter identification of a pilot reference model The identification method is derived from first order sensitivity functions to the model parameters The runs are organized to distinguish the learning from the skilled phase adaptation of the pilot to the simulation Author

A86-10258
BEHAVIORAL AIRSICKNESS MANAGEMENT PROGRAM FOR STUDENT PILOTS
D A GILES (USAF, School of Aerospace Medicine, Brooks AFB, TX) and G K LOCHRIDGE (USAF, Aerospace Medical Operations, Tinker AFB, OK) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol 56, Oct 1985, p 991-994 refs

The management of recurrent airsickness in student pilots has traditionally involved positive reinforcement of motivation and limited use of medication The Behavioral Airsickness Management (BAM) program seeks to establish an effective behavioral and cognitive intervention format for managing airsickness symptoms There were 37 student pilots experiencing recurrent airsickness who were exposed to an assessment and rehabilitation program designed to develop diaphragmatic breathing skills while rapidly reducing physiological tension via cue-evoked relaxation strategies Cognitive modification techniques were also included in the treatment protocol Of the 37 students, 35 were returned to their flying training program with no recurrences of the airsickness problems Cross-validation evidence is offered, as well as hypotheses for the program's success Author

A86-10260
THE IMPACT OF LIFE EVENTS ON PILOTS - AN EXTENSION OF ALKOV'S APPROACH
S J SLOAN and C L COOPER (University of Manchester Institute of Science and Technology, England) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol 56, Oct 1985, p 1000-1003 refs
(Contract AF-AFOSR-83-0148)

A re-examination is made of Alkov's (1980, 1981) questionnaire method of revealing the predictability of the effects of a pilot's 'life events' on the pilot's perception of event/processes relationships The questions were designed to elicit pilot perceptions of a pilot who has a significant accident potential The questionnaire was given to 442 British pilots, with the results subjected to a statistical analysis The analysis revealed that the pilots viewed the questions as evaluating emotional gains and losses and pilot characteristics It was concluded that the aspects of a pilot's psychological state must be interpreted more contextually, and therefore the questionnaire used can have only limited accuracy in evaluations of the fitness of a pilot for flight responsibilities M S K

A86-10261
THE EFFECTS OF MILD HYPOXIA ON A LOGICAL REASONING TASK
R G GREEN (Royal Air Force, Institute of Aviation Medicine, Farnborough, England) and D R MORGAN (Aircraft and Armament Experimental Establishment, Salisbury, England) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol 56, Oct 1985, p 1004-1008 refs

The initial performance of 150 humans in logical reasoning tests while experiencing mild hypoxia was assessed experimentally The subjects were divided into three groups for the tests in a decompression chamber which simulated altitudes of 305, 2440, 3050 and 3660 m, respectively, with test scores being compared to those from a classroom setting Both work speed and error rate were significantly affected by altitude The error rate for the 3660 m altitude group was significantly higher than that of other groups The decrement at 3660 m is concluded to support the results found by previous researchers with simulated higher altitudes M S K

A86-10493
OPENING UP THE ASTRONAUT SELECTION PROCESS
B M REGISTER Space World (ISSN 0038-6332), vol V-9-261, Sept 1985, p 4-7

The selection process for pilots, mission specialists, and payload specialists is discussed NASA selects pilots and mission specialists from its thousands of applications, and payload specialists are chosen by the employer who has purchased space on a Shuttle launch The requirements established by NASA for pilots and mission specialists are described The three-stage selection process which involves completing applications, interviews, and physicals is explained The qualifications of the present astronaut candidates are given The training and functions of the payload specialists, who are chosen for their expertise in fulfilling mission objectives, are described I F

A86-11147
SPATIAL-FREQUENCY MODEL FOR HYPERACUITY
C R CARLSON and R W KLOPFENSTEIN (RCA Laboratories, Princeton, NJ) Optical Society of America, Journal, A Optics and Image Science (ISSN 0740-3232), vol 2, Oct 1985, p 1747-1751 refs

Humans can detect vernier displacements of two abutted lines that are 30 times smaller than the bar spacings that determine their grating acuity Since vernier acuity tasks, and hyperacuity tasks in general, reveal such drastically improved sensitivity, it has been traditionally assumed that the detection mechanisms responsible for hyperacuity are fundamentally different from those underlying ordinary spatial acuity The need for unusual mechanisms is reinforced by the observation that hyperacuity is weakly affected by changes in suprathreshold contrast, whereas ordinary acuity is strongly influenced by contrast Nevertheless, it is argued that many hyperacuity tasks can be understood without resorting to special mechanisms A previously developed contrast-detection model, based on spatial-frequency channels, has been applied directly to a set of hyperacuity experiments Hyperacuity performance is readily predicted without modification of the model In addition, the model correctly predicts the insensitivity of hyperacuity to suprathreshold contrast as well as the measured result that moderate low-pass filtering of hyperacuity images does not significantly decrease hyperacuity performance
Author

A86-11148
PERCEIVED CONTRAST IN THE FOVEA AND PERIPHERY
M W CANNON, JR (USAF, Aviation Vision Laboratory, Wright-Patterson AFB, OH) Optical Society of America, Journal, A Optics and Image Science (ISSN 0740-3232), vol 2, Oct 1985, p 1760-1768 refs

Subjects estimated the perceived contrast of 2 deg diameter sine-wave grating patches for spatial frequencies of 2, 4, 8, and 16 cycles/deg, at eccentricities from 0 to 40 deg and contrasts up to 0 8 The data were well fitted in all cases by power functions of contrast minus threshold, with exponents of the order of 0 5 implying similar mechanisms in both fovea and periphery The data also demonstrate that, at high physical contrast, the visual system is generally driven toward an operating state in which two stimuli of equal physical contrast have equal perceived contrast even if the thresholds are quite different As a consequence, peripheral perceived contrasts produced by high physical contrasts show almost no change with eccentricity, whereas thresholds increase by at least an order of magnitude This implies that mechanisms mediating threshold detection and suprathreshold perception may be different
Author

A86-12061
SPATIAL LOCATION AND HYPERACUITY - THE CENTRE/SURROUND LOCALIZATION CONTRIBUTION FUNCTION HAS TWO SUBSTRATES
D R BADCOCK and G WESTHEIMER (California, University, Berkeley) Vision Research (ISSN 0042-6989), vol 25, no 9, 1985, p 1259-1267 refs
(Contract PHS-EY-00220)

Contribution of the distribution of light to the spatial location of a feature was studied by investigating vernier acuity and jump detection in a perturbation technique, in which flanking lines are placed to the sides of the target line It was found that the size and direction of vernier displacement, or jump, required for no apparent change of location, is influenced by the flanking line-test line distance (FTD) as well as by the contrast polarity of the flank (F) The effects of F polarity are different in the central FTD zone (i e , on both sides between the two Fs) from those in the surround Varying the duration of the F produces maximal effects in the surround with shorter duration than that required for maximal effects in the center It is concluded that the localization contribution function has two components reflecting different mechanisms: in the center, the earlier (Westheimer and McKee, 1977) centroid hypothesis can be applied, while the surround has characteristics of the feature interaction seen in aftereffects I S

A86-12431#
MEDICAL EVALUATION OF COSMONAUTS - PSYCHOLOGICAL TESTING
N RAMACHANDRAN (Indian Air Force, Institute of Aviation Medicine, Bangalore, India) Aviation Medicine, vol 28, Dec 1984, p 133-139 refs

Psychological evaluation of the cosmonauts was done at two levels One was personality evaluation and secondly assessment of their performance on a vigilance task Both projective and objective tests were used Twelve pilots were thus evaluated Stress tolerance of all the subjects was found to be adequate On the vigilance task the accuracy of spotting the correct signal ranged from 69 percent to 94 percent with an average of 87 percent No rank rating of the subjects was made, the only criterion was psychological fitness, and none of the subjects was found to be psychologically unfit
Author

N86-10745# Joint Publications Research Service, Arlington, Va
EFFECT OF EMOTIONAL STRESS ON HEMOSTASIS SYSTEM OF HEALTHY PERSONS Abstract Only
Y I SOKOLOV, T P KHOVANSKAYA, I V NOVIKOV, and M V BALUDA *In its* USSR Rept Life Sci Biomed and Behavioral Sci (JPRS-UBB-85-023) p 62 18 Sep 1985 Transl into ENGLISH from Fiziol Cheloveka (Moscow), v 11, no 1, Jan - Feb 1985 p 79-82
Avail NTIS HC A06

The effect of emotional stress on activity of the sympatho-adrenal system and of some indicators of the system of thrombocytic-vascular and plasma links of hemostasis was studied Emotional stress of the subjects caused increase of catecholamines in the blood and increases of excretion of them in the urine and activation of the anticoagulation system and increase of the blood heparin level while the fibrinolytic activity increased and the fibrogen concentration in the blood decreased Thromboelastograms recorded in the first phase of coagulation showed a tendency toward hypocoagulation in the subjects, under emotional stress. Emotional stress shows a tendency toward the increase of heparin tolerance of the plasma but does not change the ADP-induced aggregation of thrombocytes E A K

N86-10775 Institute for Perception RVO-TNO, Soesterberg (Netherlands)
STUDIES ON HUMAN VEHICLE CONTROL
H GODTHELP 1984 159 p refs
(B8563352) Avail Issuing Activity

The accuracy of closed and open loop steering were measured in a reproduction task Precognitive control aspects of open and closed loop steering in a lane change maneuver were studied Preview control in open and closed loop steering on entering a bend was investigated Straight lane keeping compensatory control and the limits of error neglecting in lane keeping were examined For closed loop conditions, amplitude accuracy is linearly dependent on movement velocity, illustrating the validity of Fitts' law for continuous, closed loop movements However, for open loop conditions the results indicate the amplitude accuracy to depend only on movement amplitude and not on velocity Driver's self-chosen occlusion times correspond closely with time of lane crossing
Author (ESA)

N86-10776 Institute for Perception RVO-TNO, Soesterberg (Netherlands)
CAR DRIVING AS A SUPERVISORY CONTROL TASK
G J BLAAUW 1984 139 p refs
(B8563351) Avail Issuing Activity

Car driving was analyzed using a supervisory driver model The driver is assumed to supervise single tasks like lateral and longitudinal vehicle control, each of which is assumed to be autonomously controlled The driver only intervenes when the conditions of a single task force him to An integral description of multitask performance in driving is possible An observation/prediction block, a control block and a decision-making block are distinguished Results suggest that lateral control does not need continuous foveal visual information In conditions creating

a minimum level of attention for lateral control, skilled and unskilled drivers show an acceptable stay within their lane, although variations in lateral control are larger than in other conditions Performance during occlusion is not much affected in relation to multitask or deteriorated driving conditions However, skilled drivers choose longer occlusion times than the unskilled drivers for comparable levels of driving performance Author (ESA)

N86-10777*# National Aeronautics and Space Administration Ames Research Center, Moffett Field, Calif
THE SYNTHESIS AND ANALYSIS OF COLOR IMAGES
B A WANDELL Sep 1985 37 p refs
(NASA-TM-86844, REPT-85419, NAS 1 15 86844) Avail NTIS HC A03/MF A01 CSCL 05I

A method is described for performing the synthesis and analysis of digital color images The method is based on two principles First, image data are represented with respect to the separate physical factors, surface reflectance and the spectral power distribution of the ambient light, that give rise to the perceived color of an object Second, the encoding is made efficient by using a basis expansion for the surface spectral reflectance and spectral power distribution of the ambient light that takes advantage of the high degree of correlation across the visible wavelengths normally found in such functions Within this framework, the same basic methods can be used to synthesize image data for color display monitors and printed materials, and to analyze image data into estimates of the spectral power distribution and surface spectral reflectances The method can be applied to a variety of tasks Examples of applications include the color balancing of color images, and the identification of material surface spectral reflectance when the lighting cannot be completely controlled Author

N86-10778# Department of the Air Force, Washington, D C
VISION TEST CHART AND METHOD USING GAUSSIANS Patent Application
H L TASK, inventor (to Air Force) 23 Jan 1985 19 p
(AD-D011756, US-PATENT-APPL-SN-693927) Avail NTIS HC A02/MF A01 CSCL 06L

A novel vision test device and method for measuring the ability of a subject to perceive contrasts is described, which comprises a chart for display to the subject having a plurality of visual test shapes systematically organized thereover in a predetermined array on a background of preselected luminance or reflectance level, each test shape having a preselected luminance level providing maximum contrast relative to background at its center and substantially zero contrast relative to background at its edges, the luminance (or reflectance) level of each test shape varying radially from its preselected distribution factor GRA

N86-10779# Office of Naval Research, Arlington, Va Psychological Sciences Div
PSYCHOLOGICAL SCIENCES DIVISION 1984 PROGRAMS Annual Report, 1 Jan. - 1 Dec. 1984
M A TOLCOTT 1 Dec 1984 184 p
(AD-A156631, REPT-442-4) Avail NTIS HC A09/MF A01 CSCL 05J

This booklet describes research carried out under the Psychological Sciences Division of ONR during Fiscal Year 1984 The booklet is divided into three programmatic research area Engineering Psychology, Personnel and Training, and Organizational Effectiveness - the last area will be re-named Group Psychology in Fiscal Year 1985 Specific study areas are Man-Machine System Interfaces, Perception, Decision Making, Distributed Tactical Decision Making, Special Projects Man-Machine Systems Technology, Defense Small Business Advanced Technology Program, Effective Heterogeneous Groups, personnel Turnover and Retention, Productivity in Organizations, Manpower R&D Programs, Theory-Based Personnel Assessment, Information-Processing Abilities, Attention and Action, Instructional Theory and Methods, Cognitive Processes Each report within these sections gives specific objectives, approach, progress, potential applications GRA

N86-10780# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Hamburg (West Germany) Abt Flugphysiologie und Psychologie
EXTENDED ANALYSIS OF THE STRUCTURE OF ERROR SCORES IN PSYCHOLOGICAL APTITUDE TESTS
K M GOETERS Mar 1985 50 p refs In GERMAN, ENGLISH summary Report will also be announced as translation (ESA-TT-943)
(DFVLR-FB-85-20, ISSN-0171-1342) Avail NTIS HC A03/MF A01, DFVLR, Cologne DM 16 50

A series of psychological aptitude tests was analyzed with respect to human performance and reliability A factor analysis of the test scores reveals five components of performance Three independent error components are extracted errors in quick visual detection of targets, difficulties in mental processing of numbers and symbols, and erroneous actions under performance stress All three factors are the expression of a deficient control of performance They are discussed as functional aspects of decision making and human information processing Author (ESA)

N86-10781# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Hamburg (West Germany) Abt Flugphysiologie und Psychologie
SPEED OF WORK AND ERROR RATE: ANALYSES OF INDIVIDUAL DIFFERENCES IN A CHOICE REACTION SERIES WITH A COGNITIVE COMPONENT
K M GOETERS Mar 1985 27 p refs In GERMAN, ENGLISH summary Report will also be announced as translation (ESA-TT-944)
(DFVLR-FB-85-21, ISSN-0171-1342) Avail NTIS HC A03/MF A01, DFVLR, Cologne DM 10 50

A visual choice reaction test with a cognitive component was introduced to measure response processes in more detail than is possible with summarizing scoring of paper pencil tests For each reaction the following information was registered stimulus (light), reaction (right/wrong), reaction time, and omission (yes/no) Each subject had to react on 320 successive signals without pause From the reaction protocol of each subject indices for speed of work, oscillation of performance, error disposition, and reaction inhibition were computed The main result is that in this reaction test speed of work and error disposition are not coupled Errors are not a consequence of quick reactions The observed errors seem to be the expression of an increased variation in performance The results are discussed with a view to a psychophysiological model of activation Author (ESA)

N86-10782# Institute for Perception RVO-TNO, Soesterberg (Netherlands) Afd Psychologie
STANDARDIZATION OF TASKS: APPROACH PLANNING
A W K GAILLARD and L C BOER Jul 1984 19 p In DUTCH, ENGLISH summary
(Contract A83/K/045)
(IZF-1984-19, TDCK-79518) Avail NTIS HC A02/MF A01

Ten information processing tasks were grouped on a micro-computer for use in, e g , personnel selection, the registration of pyschological fitness (combat readiness) and assessing mental workload Testing areas are reaction time, (continuing) memory searching, selective attention, pursuit-tracking, serial memory, word classification, logical arguing, and response-conflict situations The program is developped to be administered by personnel with 1 week training Author (ESA)

N86-10783# Institute for Perception RVO-TNO, Soesterberg (Netherlands) Traffic Behavior Group
PATH ERROR-NEGLECTION IN STRAIGHT LANE DRIVING
J GODTHELP Oct 1984 21 p refs
(IZF-1984-32, TDCK-79698) Avail NTIS HC A02/MF A01

Decision rules, describing how drivers switch from error-neglection to error-correction when approaching the edge of a lane, were derived for a straight lane keeping task Drivers were instructed to neglect the vehicle path error and to switch over to error-correction only at that moment The vehicle motion still could comfortably be corrected to prevent a crossing of the

lane boundary The results show that the lateral distance from the lance boundary at which drivers switch to error-correction increases linearly with the lateral approach speed This mechanism results in a constant time to lane crossing distance at this decision moment, this result being consistant for a broad range of speeds
Author (ESA)

N86-11850*# Old Dominion Univ , Norfolk, Va Dept of Psychology
VISUAL INFORMATION TRANSFER. PART 1: ASSESSMENT OF SPECIFIC INFORMATION NEEDS. PART 2: PARAMETERS OF APPROPRIATE INSTRUMENT SCANNING BEHAVIOR Progress Report, 15 Feb. - 15 Oct. 1985
J R COMSTOCK, JR , R H KIRBY, and G D COATES Oct 1985 11 p refs
(Contract NAG1-451)
(NASA-CR-176277, NAS 1 26 176277) Avail NTIS HC A02/MF A01

The present study explored eye scan behavior as a function of level of subject training Oculometric (eye scan) measures were recorded from each of ten subjects during training trials on a CRT based flight simulation task The task developed for the study incorporated subtasks representative of specific activities performed by pilots, but which could be performed at asymptotic levels within relatively short periods of training Changes in eye scan behavior were examined as initially untrained subjects developed skill in the task Eye scan predictors of performance on the task were found Examination of eye scan in proximity to selected task events revealed differences in the distribution of looks at the instruments as a function of level of training Author

N86-11851# Pennsylvania State Univ , University Park Dept of Psychology
ADAPTIVE MOTIVATION THEORY Final Report
F J LANDY and W S BECKER Jun 1985 69 p
(Contract N00014-81-K-0197)
(AD-A157440, REPT-85-1) Avail NTIS HC A04/MF A01
CSCL 05J

Traditional approaches to understanding motivation have not been successful Middle range theories are necessary for progress in this area Cognitive processes will play a major role in motivation theories of the future Various middle range theories are likely to be more suitable for understanding some dependent variables than others The work on adaptive motivation theory was intended to be preliminary, exploring the possible advantages of a reconceptualization of motivation theory In this report, we see our goal as introducing some lines of speculation, sampling some recent research that gives rise to that speculation, and presenting specimens of new theory and research designs and, ultimately, persuading the reader to pick up the burden of a novel idea or approach and to carry it some distance for us Various technical and quarterly reports have detailed the development of questionnaires and methods of measuring components of adaptive motivation theory In this report, we identify the nature and extent of that conceptual work In effect, we suggest that it may be valuable to explore more deeply the cognitive roots of many of the current approaches Through such an exploration, it may be possible to develop a set of middle range theories capable, in aggregate, of explaining motivated behavior GRA

N86-11852# Oregon Univ , Eugene Dept of Psychology
COGNITIVE SCIENCE PROGRAM: DISSOCIATION OF THE CENTRAL TIMEKEEPER AND THE PERIPHERAL IMPLEMENTATION PROCESSES IN REPETITIVE MOVEMENTS Final Technical Report
R B IVRY and S W KEELE 15 May 1985 23 p
(Contract N00014-83-K-0601)
(AD-A157542, TR-85-7-ONR) Avail NTIS HC A02/MF A01
CSCL 06E

Wing and Kristofferson (1973) have proposed a two-stage model of timing in repetitive motor behavior which assumes independence of a central timekeeper process and the peripheral implementation system This model was tested with a patient who has incurred a peripheral motor neuropathy The patient's inconsistent performance in a periodic tapping task with the afflicted hand was found to be attributable to increased variability in the motor implementation process only This report, in conjunction with the previous study of Wing et al , (1984) in which a Parkinsonian patient was found to have a timekeeper deficit, provides a double dissociation of the timekeeper and implementation processes Thus, the independence assumption of the Wing and Kristofferson model is supported GRA

N86-11853# Lawrence Livermore National Lab , Calif
PSYCHOLOGICAL ASPECTS OF PERSONNEL CONTAMINATION
R L WILSON Apr 1985 7 p refs Presented at the Hazardous Mater Conf , Oakland, Calif , 23 Apr 1985
(Contract W-7405-ENG-48)
(DE85-012955, UCRL-92501, CONF-8504140-1) Avail NTIS HC A02/MF A01

This paper discusses some of the major emotional considerations involved in the treatment of people who have been contaminated with potentially hazardous materials Although the principal focus is the treatment of people trained to work with these materials, an attempt is also made to extend these methods to people having little or no knowledge of such matters Accidents always result in emotional trauma When the accident involves radioactive or other potentially toxic, carcinogenic, or mutagenic materials, there is a possibility of enhanced emotional stress due to the mystique surrounding these substances Several psychological principles that have emerged from the treatment of radioactively contaminated workers are (1) provide preaccident training for all radiation workers, (2) avoid secrets, (3) as rapidly as possible following a contamination accident, bring the worker into contact with others, (4) recognize the emotions of the family and the family's fears and trauma, and (5) do not desert the worker after decontamination has been completed DOE

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MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering, biotechnology, and space suits and protective clothing

A86-10102
NONINVASIVE DOPPLER DETERMINATION OF CARDIAC OUTPUT DURING SUBMAXIMAL AND PEAK EXERCISE
J G SHAW, E C JOHNSON, W F VOYLES, and E R GREENE (Lovelace Medical Foundation, New Mexico, University, Albuquerque, NM) Journal of Applied Physiology (ISSN 0161-7567), vol 59, Sept 1985, p 722-731 refs

Stroke volume (SV) and cardiac output (CO) were measured as a function of work load by a pulsed Doppler (PD) technique, obtaining the Doppler-shifted frequency from the ascending aorta of 10 sitting subjects who were exercized on an ergometer to exertion The PD-generated CO and CV values in 207 determinations were assessed for technical reproducibility of the PD method, and compared with the literature values obtained by standard invasive methods Technical reproducibility was estimated by comparing with paired t test the differences between 65 duplicate serial measurements of CO and CV No significant differences (P less than 0 001) were found Absolute values of CO and CV understimated the literature values across all work loads by 15 to 21 percent Possible factors for these differences are discussed
I S

A86-10158
HIERARCHY OF CONTROL MODELS FOR TEMPERATURE REGULATION
J WERNER (Bochum, Ruhr-Universitaet, West Germany) International Journal of Modelling and Simulation (ISSN 0228-6203), vol 5, no 2, 1985, p 58-63 refs
(Contract DFG-SFB-114)

Five different mathematical models for the control loop regulating human body temperature are reviewed, along with possible applications A one-loop model for passive control has exhibited promise for understanding steady-state thermoregulation and the fever process Core-shell models describe heat flow and are particularly well-suited to studying the effects of workload on thermoregulation Multi-element (layer) models treat the body as a collection of cylinders arranged in concentric layers, each coupled by circulation, and allowing depiction of the dynamics of thermoregulation Multi-element (circle) models portray body segments as cylinders coupled by a one-loop circulatory system, permitting examination of the radial dependencies of temperature within the body Finally, three-dimensional models are applied in analyses of the distributed parameter control system, and are an approach to the nonlinear properties of the biological control loop Effective use of the models requires access to fast, large capacity computers M S K

A86-10263
THERMAL INSULATING CAPABILITIES OF 'THIN' CLOTHING INSULATION
W C KAUFMAN and D J BOTHE (Wisconsin, University, Green Bay) Aviation, Space, and Environmental Medicine (ISSN 0095-6562), vol 56, Oct 1985, p 1011-1013 Research supported by the Eddie Bauer Co and Gillette Industries refs

Swatches and sleeping bags composed of polyolefin, down and polyester were placed over a heat source to test the thermal insulating properties of the materials Thermistors on each side of the cloth furnished temperature data The data were analyzed by an equation which took into account the presence of an air layer, which is classically thought to enhance the insulating properties The polyolefin fibers did not exhibit superior insulating properties beyond those available from any thin fabric The air layer/down loft was the principal agent of increased insulation M S K

A86-12379
HEMODYNAMIC EFFECTS OF ANTI-G SUIT INFLATION IN A 1-G ENVIRONMENT
J F SEAWORTH, T J JENNINGS, L L HOWELL, J W FRAZIER, C D GOODYEAR (USAF, Aerospace Medical Research Laboratory and Medical Center, Wright-Patterson AFB, OH) et al Journal of Applied Physiology (ISSN 0161-7567), vol 59, Oct 1985, p 1145-1151 refs

The effect of anti-G suit inflation on cardiac volumes, cardiac output, and peripheral vascular resistance was assessed Two-dimensional echocardiography was used to measure end-diastolic and end-systolic volumes at rest and after inflation of the anti-G suit with pressures of 2, 4, and 6 psi in 10 male subjects in both standing and supine positions In the supine position, mean arterial pressure increased from base-line for all three inflation pressures The end-diastolic volume increased after 2-psi inflation Cardiac output or stroke volume did not change After standing, mean arterial pressure, end-diastolic volume, and stroke volume fell after suit deflation Peripheral vascular resistance fell in the 2and 4-psi inflation profiles In the standing protocol, mean arterial pressure, end-diastolic volume, stroke volume, and cardiac output rose with all three inflation pressures After reclining, heart rate increased and mean arterial pressure fell in the 4- and 6-psi inflation profiles after suit deflation C D

A86-12436#
VIBRATION TRANSMISSIBILITY IN SEATED SUBJECTS
M K VYAWAHARE and D T SHAKUNTHALA (Indian Air Force, Institute of Aviation Medicine, Bangalore, India) Aviation Medicine, vol 28, Dec 1984, p 162-170 refs

Vibration transmissibility at shoulder and thigh levels in upright seated individuals with respect to seat vibration is determined The electrohydraulic vibrator, seat, cockpit, piezoelectric accelerometer, and vibration meter used in the experiment are described The procedures for testing shoulder and thigh vibration transmissibility in subjects seated directly on a seat, on a compressible cushion, on a fiber glass pad, and on a fiber glass pad plus a fiber glass back rest are explained The vibration transmission was measured and the results for the mean value of thigh and shoulder level vibration transmissibility and maximum thigh and shoulder level vibration transmissibility versus body weight are tabularly presented The data is explained and it is concluded that vibration intensity at thigh and shoulder levels of a seated upright subject is less than at the seat level I F

N86-10784 Ohio State Univ , Columbus
THE INFLUENCE OF TACTUAL SEAT-MOTION CUES ON TRAINING AND PERFORMANCE IN A ROLL-AXIS COMPENSATORY TRACKING TASK SETTING Ph.D. Thesis
E A MARTIN 1985 327 p
Avail Univ Microfilms Order No DA8510600

A considerable body of knowledge exists regarding the influence of whole-body motion on the control behavior and task performance of a vehicle operator required to compensate for the effects of unexpected external disturbances The research described was conducted to determine whether similar effects would be observed if the motion information were tactually displayed through the seat pan, rather than in a whole-body motion environment The experiment was designed such that the transfer of training from a tactual dynamic seat display to a whole-body motion environment could also be evaluated The environmental task required subjects to regulate for a random-appearing, roll-axis disturbance in a simulated vehicle having aircraft-like dynamics A centrally located compensatory display, subtending about nine degrees, provided visual roll error information Control inputs were made via a right side-arm isometric controller The two-phase experiment included a training phase and a criterion phase The data clearly demonstrate that a dynamic sea pan can effectively impart motion information Dissert Abstr

N86-10785*# Pennsylvania Univ , Philadelphia Dept of Computer and Information Science
TEMPUS: SIMULATING PERSONNEL AND TASKS IN A 3-D ENVIRONMENT Final Report
N I BADLER and J D KOREIN 31 May 1985 18 p
(Contract NAS9-16634)
(NASA-CR-171901, NAS 1 26 171901) Avail NTIS HC A02/MF A01 CSCL 05H

The latest TEMPUS installation occurred in March, 1985 Another update is slated for early June, 1985 An updated User's Manual is in preparation and will be delivered approximately mid-June, 1985 NASA JSC has full source code listings and internal documentation for installed software NASA JSC staff has received instruction in the use of TEMPUS Telephone consultations have augmented on-site instruction G L C

N86-10786# Defence Research Establishment, Ottawa (Ontario)
EFFECT OF INCREASED BODY CLOTHING INSULATION ON HAND TEMPERATURE IN A COLD ENVIRONMENT
S D LIVINGSTONE, R W NOLAN, and S W CATTROLL Dec 1984 17 p
(AD-A156597, DREO-TN-84-26) Avail NTIS HC A02/MF A01 CSCL 06Q

Thermal protection of personnel who must remain relatively inactive while performing tasks outdoors in the cold is a continuing problem Provision of comfort and allowing for mobility are design difficulties experienced by persons working in the cold at tasks

for which manual dexterity is required is In such situations only very light handwear can be worn and often, mitts or gloves must be removed in order to perform the task A particular example of such a task exists at the CF Satellite Tracking and Identification Unit at St. Margaret's, New Brunswick The telescope which is used for tracking satellites is located outdoors when operational To minimize optical interference, the area around the telescope cannot be heated in winter During the course of the tracking sequence, which takes about 30 minutes, the operator must be in contact with the large metal mass of the telescope In addition, the operation of the steering control button requires that if any handwear is worn, it must be very thin Operating temperatures as low as -20 C are often experienced It was found that, as predicted, if additional insulation was applied to the whole body of the man, the temperature of his hands could be maintained for a longer period of time GRA

N86-10787# Air Force Inst of Tech, Wright-Patterson AFB, Ohio
MILD HYPOXIA AND VISUAL PERFORMANCE WITH NIGHT VISION GOGGLES M.S. Thesis
L L LEBER May 1985 57 p
(AD-A156969, AD-E950724, AFIT/CI/NR-85-35T) Avail NTIS HC A04/MF A01 CSCL 06E

Pilots have frequently reported an apparent darkening of the visual field while flying at high altitude without supplemental oxygen, and subsequent exposure to oxygen resulted in marked increases in the brightness of lights Likewise, at low light intensities visual acuity is greatly decreased during oxygen deprivation In contrast, at high light intensities, the effect of moderate oxygen deprivation on visual acuity is slight Even though the Night Vision Goggles (NVGs) amplify low night illumination, the interaction between amplified illumination and high altitude effects may provide to be important factors in visual performance The objective of this research was to investigate the effects of mild hypoxid aon monocular visual performance with NVGs This study revealed that mild oxygen deprivation significantly affects unaided square-0wave grating visual acuity but does not significantly affect NVG-augmented performance Large differences between visual sensitivities at different spatial frequencies were not differentially affected by mild hypoxia Supplemental oxygen did significantly improve naked-eye but not NVG-augmented night resolution acuity up to an altitude of 13,000 feet (3,692 m) above sea level (ASL) GRA

N86-10788# Aeronautical Research Labs, Melbourne (Australia)
A GRAPHIC ANTHROPOMETRIC AID FOR SEATING AND WORKPLACE DESIGN
K C HENDY, K W ANDERSON, and D M DRUMM Apr 1984 60 p
(AD-A156988, AD-E950724, ARL/SYS-R-29) Avail NTIS HC A04/MF A01 CSCL 06N

In recent workplace design projects at ARL, a procedure for the use of anthropometric information has be developed which relies on the use of sets of anthropometric data from individuals rather than the conventionally used pooled data This report describes a graphic anthropometric design aid which has been devised to assist in the implementation of this procedure The aid predicts the positions, in side elevation, of certain cardinal points which are considered to be important to the design process, viz, the eye, thumb tip reach, knee point, seat reference point and heel point This report also contains details of the design aid's validation, the concept of the aid's use and the fidelity of the aid within the design process GRA

N86-10789# Institute for Perception RVO-TNO, Soesterberg (Netherlands) Afd Thermofysiologie
THE WEARING COMFORT OF THE PVC: COMBAT BACK PACK
F J G VANDERLINDE and H VANMIDDENDORP Nov 1984 24 p In DUTCH, ENGLISH summary
(Contract A79/KL/097)
(IZF-1984-34, TDCK-79782) Avail NTIS HC A02/MF A01

A PVC coated back pack was compared to canvas ones Wearing comfort, particularly with regard to sweat build-up, body temperatures, and thermal sensation were studied Data from two subjects walking on a treadmill in a climate chamber were obtained The PVC prototype scores slighthy better the canvas rucksack Author (ESA)

N86-11854*# Martin Marietta Aerospace, Denver, Colo
TELEOPERATOR HUMAN FACTORS STUDY Progress Report, 7 Sep. - 6 Oct. 1985
K Z BRADFORD and R T SCHAPPELL Oct 1985 6 p
(Contract NAS8-35184)
(NASA-CR-176310, NAS 1 26 176310, MCR-83-607) Avail NTIS HC A02/MF A01 CSCL 05H

The progress made on the Teleoperator Human Factors Study program during the period of September 7, 1985 to October 6, 1985 is discussed Technical and programmatic problems that were encountered are discussed along with activity planned for the following month The main portion of the report has been separated into four sections Work Performed, Future Work, Problems Encountered, and Cost Information G L C

N86-11855# Oak Ridge National Lab, Tenn
MECHANICAL ACCESSORIES FOR MOBILE TELEOPERATORS
M J FELDMAN and J N HERNDON 1985 19 p Presented at the Workshop on Requirements of Mobile Teleoperators for Radiol Emergency Response and Recovery, Dallas, 23 Jun 1985
(Contract DE-AC05-84OR-21400)
(DE85-014310, CONF-8506148-2) Avail NTIS HC A02/MF A01

The choice of optimum mechanical accessories for mobile teleoperators involves matching the criteria for emergency response with the available technology A general background is presented to teleoperations, a potpourri of the manipulator systems available, and an argument for force reflecting manipulation The theme presented is that the accomplishment of humanlike endeavors in hostile environments will be most successful when man model capabilities are utilized The application of recent electronic technology to manipulator development has made new tools available to be applied to emergency response activities The development activities described are products of the Consolidated Fuel Reprocessing Program at the Oak Ridge National Laboratory DOE

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PLANETARY BIOLOGY

Includes exobiology, and extraterrestrial life

A86-12003
RADIATION CHEMISTRY OF AN AQUEOUS SOLUTION OF GLYCINE COMPOUNDS OF INTEREST TO CHEMICAL EVOLUTION STUDIES
Z D DRAGANIC, S I VUJOSEVIC (Universidad Nacional Autonoma de Mexico, Mexico City), and V NIKETIC (Beograd, Univerzitet, Belgrade, Yugoslavia) Journal of Molecular Evolution (ISSN 0022-2844), vol 22, no 1, 1985, p 82-90 Research supported by the Serbian Research Fund. refs

An examination has been conducted of the radiolysis of an O2-free aqueous solution of glycine at absorbed doses of Co-60 gamma-radiation of up to 20 Mrad At least 20 compounds are formed during radiolysis, among them several amino acids, an

oligoamine, and the nitrogen-free polymers (Mw equal to or less than 28,000 daltons) When dicyandiamide is present in the solution of glycine, various nitrogen-containing products, including some polymers (Mw equal to or less than 12,000 daltons), are synthesized along with radiolytic products of glycine, polyglycines are not formed The radiation-chemical yields of radiolytic-product formation and of decomposition of glycine have been determined and possible free-radical reactions leading to the radiation-induced changes observed have been considered Author

A86-12004
COULD LIFE HAVE ARISEN IN THE PRIMITIVE ATMOSPHERE?
S SCHERER (Konstanz, Universitaet, Constance, West Germany) Journal of Molecular Evolution (ISSN 0022-2844), vol 22, no 1, 1985, p 91-94 refs

A model developed in connection with a modification and extension of concepts proposed by Oparin (1924) provides currently the basis for almost all attempts to explain the origin of life However, in spite of the common acceptance of the Oparin model, Woese (1979, 1980) has rejected the Oparin thesis and proposed a completely new hypothesis on the origin of life The present communication provides a fundamental critique of the alternative model suggested by Woese, Woese had assumed that the progenitors of life originated in the atmosphere A number of arguments against the new model are discussed These arguments are related to the presence of free oxygen and ultraviolet radiation, convection cycles, the suspension time of droplets, and the consideration of chemical limits G R

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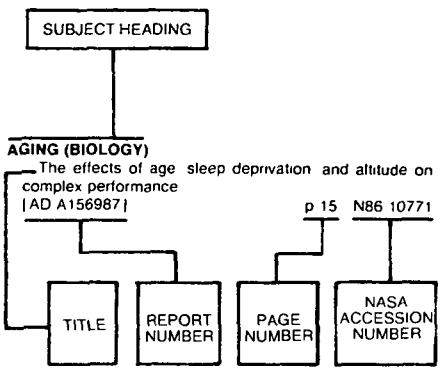

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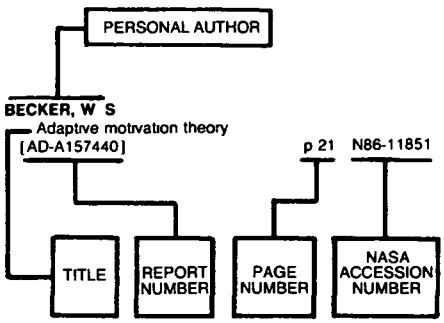

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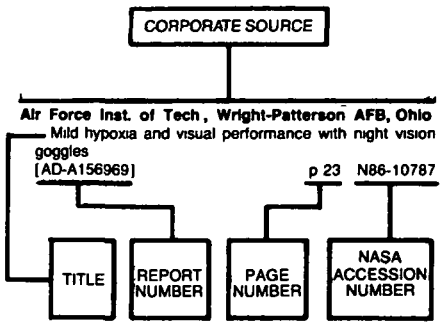

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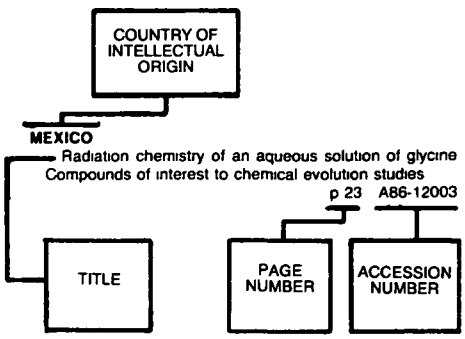

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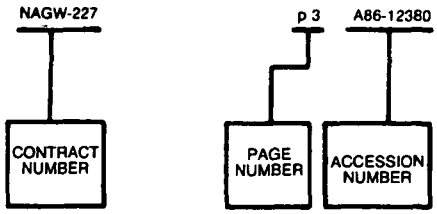

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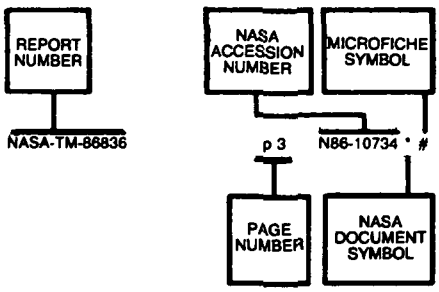

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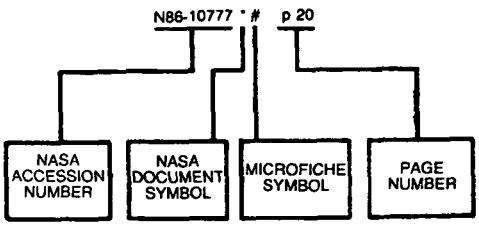

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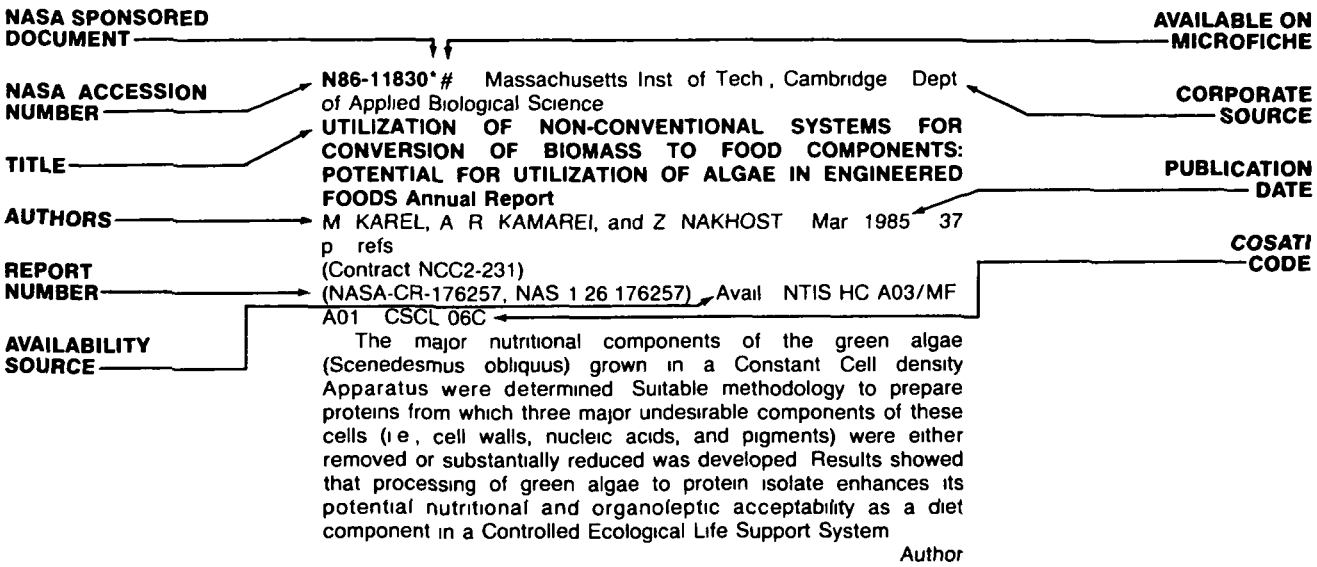

N86-11830*# Massachusetts Inst of Tech , Cambridge Dept of Applied Biological Science

UTILIZATION OF NON-CONVENTIONAL SYSTEMS FOR CONVERSION OF BIOMASS TO FOOD COMPONENTS: POTENTIAL FOR UTILIZATION OF ALGAE IN ENGINEERED FOODS Annual Report

M KAREL, A R KAMAREI, and Z NAKHOST Mar 1985 37 p refs

(Contract NCC2-231)

(NASA-CR-176257, NAS 1 26 176257) Avail NTIS HC A03/MF A01 CSCL 06C

The major nutritional components of the green algae (Scenedesmus obliquus) grown in a Constant Cell density Apparatus were determined Suitable methodology to prepare proteins from which three major undesirable components of these cells (i e , cell walls, nucleic acids, and pigments) were either removed or substantially reduced was developed Results showed that processing of green algae to protein isolate enhances its potential nutritional and organoleptic acceptability as a diet component in a Controlled Ecological Life Support System

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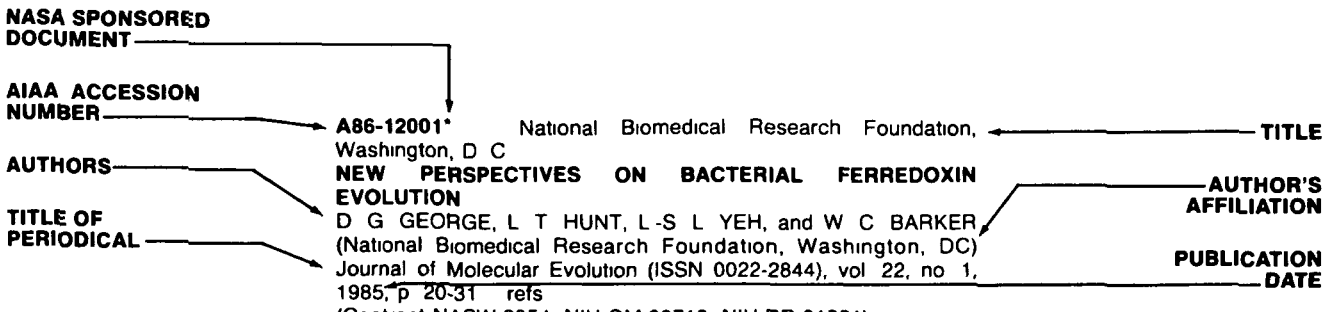

A86-12001* National Biomedical Research Foundation, Washington, D C

NEW PERSPECTIVES ON BACTERIAL FERREDOXIN EVOLUTION

D G GEORGE, L T HUNT, L-S L YEH, and W C BARKER (National Biomedical Research Foundation, Washington, DC)

Journal of Molecular Evolution (ISSN 0022-2844), vol 22, no 1, 1985, p 20-31 refs

(Contract NASW-3954, NIH-GM-08710, NIH-RR-01821)

Ferredoxins are low-molecular-weight, nonheme, iron proteins which function as electron carriers in a wide variety of electron transport chains Howard et al (1983) have suggested that the amino end of Azotobacter vinelandii ferredoxin shows a greater similarity to the carboxyl end of ferredoxin from Chromatium vinosum and that their half-chain sequences are homologous when the half-chains of either species are considered in inverse order Examination of this proposition has made it necessary to reevaluate previous conclusions concerning the evolution of bacterial ferredoxin Attention is given to the properties of the bacterial ferredoxin sequences, and the evolution of the bacterial ferredoxins

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UNIV. OF HAWAII LIBRARY
Govt. Documents Collection
2550 The Mall
Honolulu, HI 96822
(808) 948-8230

UNIV. OF IDAHO LIBRARY
Documents Section
Moscow, ID 83843
(208) 885-6344

ILLINOIS STATE LIBRARY
Information Services Branch
Centennial Building
Springfield, IL 62706
(217) 782-5185

INDIANA STATE LIBRARY
Serials Documents Section
140 North Senate Avenue
Indianapolis, IN 46204
(317) 232-3686

UNIV. OF IOWA LIBRARIES
Govt. Documents Department
Iowa City, IA 52242
(319) 353-3318

UNIVERSITY OF KANSAS
Doc. Collect—Spencer Lib.
Lawrence, KS 66045
(913) 864-4662

UNIV. OF KENTUCKY LIBRARIES
Govt. Pub. Department
Lexington, KY 40506
(606) 257-3139

LOUISIANA STATE UNIVERSITY
Middleton Library
Govt. Docs. Dept.
Baton Rouge, LA 70803
(504) 388-2570

LOUISIANA TECHNICAL UNIV. LIBRARY
Documents Department
Ruston, LA 71272
(318) 257-4962

UNIVERSITY OF MAINE
Raymond H. Fogler Library
Tri-State Regional Documents Depository
Orono, ME 04469
(207) 581-1680

UNIVERSITY OF MARYLAND
McKeldin Lib.—Doc. Div.
College Park, MD 20742
(301) 454-3034

BOSTON PUBLIC LIBRARY
Government Docs. Dept.
Boston, MA 02117
(617) 536-5400 ext. 226

DETROIT PUBLIC LIBRARY
Sociology Department
5201 Woodward Avenue
Detroit, MI 48202
(313) 833-1409

MICHIGAN STATE LIBRARY
P.O. Box 30007
Lansing, MI 48909
(517) 373-0640

UNIVERSITY OF MINNESOTA
Government Pubs. Division
409 Wilson Library
309 19th Avenue South
Minneapolis, MN 55455
(612) 373-7813

UNIV. OF MISSISSIPPI LIB.
Documents Department
University, MS 38677
(601) 232-5857

UNIV. OF MONTANA
Mansfield Library
Documents Division
Missoula, MT 59812
(406) 243-6700

NEBRASKA LIBRARY COMM.
Federal Documents
1420 P Street
Lincoln, NE 68508
(402) 471-2045
In cooperation with University of Nebraska-Lincoln

UNIVERSITY OF NEVADA LIB.
Govt. Pub. Department
Reno, NV 89557
(702) 784-6579

NEWARK PUBLIC LIBRARY
5 Washington Street
Newark, NJ 07101
(201) 733-7812

UNIVERSITY OF NEW MEXICO
Zimmerman Library
Government Pub. Dept.
Albuquerque, NM 87131
(505) 277-5441

NEW MEXICO STATE LIBRARY
Reference Department
325 Don Gaspar Avenue
Santa Fe, NM 87501
(505) 827-2033, ext. 22

NEW YORK STATE LIBRARY
Empire State Plaza
Albany, NY 12230
(518) 474-5563

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL
Wilson Library
BA/SS Documents Division
Chapel Hill, NC 27515
(919) 962-1321

UNIVERSITY OF NORTH DAKOTA
Chester Fritz Library
Documents Department
Grand Forks, ND 58202
(701) 777-2617, ext. 27
(In cooperation with North Dakota State Univ. Library)

STATE LIBRARY OF OHIO
Documents Department
65 South Front Street
Columbus, OH 43215
(614) 462-7051

OKLAHOMA DEPT. OF LIB.
Government Documents
200 NE 18th Street
Oklahoma City, OK 73105
(405) 521-2502

OKLAHOMA STATE UNIV. LIB.
Documents Department
Stillwater, OK 74078
(405) 624-6546

PORTLAND STATE UNIV. LIB.
Documents Department
P.O. Box 1151
Portland, OR 97207
(503) 229-3673

STATE LIBRARY OF PENN.
Government Pub. Section
P.O. Box 1601
Harrisburg, PA 17105
(717) 787-3752

TEXAS STATE LIBRARY
Public Services Department
P.O. Box 12927—Cap. Sta.
Austin, TX 78753
(512) 471-2996

TEXAS TECH UNIV. LIBRARY
Govt. Documents Department
Lubbock, TX 79409
(806) 742-2268

UTAH STATE UNIVERSITY
Merrill Library, U.M.C. 30
Logan, UT 84322
(801) 750-2682

UNIVERSITY OF VIRGINIA
Alderman Lib.—Public Doc.
Charlottesville, VA 22901
(804) 924-3133

WASHINGTON STATE LIBRARY
Documents Section
Olympia, WA 98504
(206) 753-4027

WEST VIRGINIA UNIV. LIB.
Documents Department
Morgantown, WV 26506
(304) 293-3640

MILWAUKEE PUBLIC LIBRARY
814 West Wisconsin Avenue
Milwaukee, WI 53233
(414) 278-3000

ST. HIST LIB. OF WISCONSIN
Government Pub. Section
816 State Street
Madison, WI 53706
(608) 262-4347

WYOMING STATE LIBRARY
Supreme Ct. & Library Bld.
Cheyenne, WY 82002
(307) 777-6344

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